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ABSTRACT

The purpose of the Transition to Technology Program (TTT) is to introduce persons who have traditionally not been exposed to technological education or careers to an overview of the basic concepts of technology and career options in technical fields. Women, minorities, and the economically and educationally disadvantaged, those groups with low representation in technical education and employment, comprise the primary audience for the program. TTT is a one-semester, nine-hour per week, team-taught interdisciplinary program. Components are modularized and include career advisement and guidance and basic instruction in manufacturing materials and processes, industrial graphics, electronics, computers, and technical mathematics. Course techniques include lecture, small and large group discussions and instruction, speakers from and field trips to local industry, demonstrations, and opportunities for skills development. Following a discussion of program costs and descriptions of the implementation, evaluation, and revision of the program, appendices illustrate its various aspects. These cover: (1) the projected distribution of 166,500 job opportunities among major occupational groups in Santa Clara County; (2) enrollments and student characteristics in occupational programs; (3) student math background; (4) TTT evaluation report and instrument; (5) field trip questionnaire; (6) course development guide; and (7) course outlines. (MB)

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PLANNING AND IMPLEMENTATION OF THE TRANSITION TO TECHNOLOGY PROGRAM (TTT) AT EVERGREEN VALLEY COLLEGE SAN JOSE, CALIFORNIA

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JC 790 162

Prepared by Marjorie K. Blaha
Provost: Educational Services
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January, 1979

PLANNING AND IMPLEMENTATION OF THE
TRANSITION TO TECHNOLOGY PROGRAM (TTT)
AT EVERGREEN VALLEY COLLEGE
SAN JOSE, CALIFORNIA

INTRODUCTION

Evergreen Valley College was awarded a one-year small grant under the Women's Educational Equity Act in September 1976 to develop, implement and disseminate a model instructional program, Transition to Technology (TTT). The purpose of the Transition to Technology Program is to introduce persons who have traditionally not been exposed to technological education or careers to an overview of the basic concepts of technology and the available career options in technical fields. TTT is also directed toward persons already employed in nontechnical positions who have reached a plateau or become locked in employment classifications with no career-ladder options. Women, minorities and the economically and educationally disadvantaged, those groups with traditionally low representation in technical education and employment, comprise the primary audience for TTT.

NEED FOR THE PROGRAM

As opportunities for employment in technical fields increase, and affirmative action requirements are implemented by employers, educational institutions must provide the opportunity and encouragement for women and minorities to consider education in areas outside of the traditional liberal arts, social sciences and helping professions. Of the job opportunities in major occupational groups projected for 1975-80 in the San Jose area, 25.4% are in the technical and professional area. (See Appendix A.)

Although the San Jose Community College District offers many programs and support services for nontraditional students, including Reentry to Education Programs, Women in Transition Programs, and Extended Opportunity Programs and Services (EOPS), neither college in the District has experienced a significant increase

in enrollment of nontraditional students in technically oriented programs. For example, recent figures for Evergreen Valley College showed only three women enrolled in mechanics courses out of 319 students in the program; whereas, of the 233 students enrolled in the liberal arts, 136 were women. (See Appendix B for a report of the number of District students, by sex, enrolled in and completing specific occupational programs.) A District survey of the career development needs of women indicated that 75% of those responding wished to continue their education and take special training. In another study administered to assess the need for a career education center in the community, results showed that residents, particularly women and minorities, wanted assistance in making career decisions and an opportunity to acquire information on career options, job availability and job survival skills. Many factors, including fear of mathematics, acceptance of stereotyped attitudes towards nontraditional students in technical fields and the lack of role models, have contributed to the general social conditioning that prevents most nontraditional students from considering careers in technology. Programs such as Transition to Technology are essential to help eliminate the educational and career barriers faced by nontraditional students.

PROGRAM GOALS

Transition to Technology has the following goals:

1. To expand the career options for nontraditional students, particularly women, minorities and low income, by encouraging these students to explore the potential of technical education and technical careers.

2. To develop an effective program of instruction, experiential activities, and career counseling, testing and advising for students enrolled in the program.

3. To increase the number of nontraditional students entering technical education and careers.

4. To assist nontraditional students in making career choices that best fit their interests and goals.

5. To increase awareness among college faculty, administration, and industry of the need to provide opportunities for nontraditional students to consider the option of education and employment in technical fields.

6. To help decrease the social conditioning that prevents nontraditional students from considering or entering technical fields.

PROGRAM OBJECTIVES

During the initial year of the Program, 1976-77, the objectives for Transition to Technology were:

1. To develop and refine the overall program design and components.

2. To identify instructors with course content expertise and sensitivity to nontraditional students.

3. To provide general inservice orientation for selected instructors.

4. To develop instructional modules and program materials.

5. To develop evaluation instruments for program and attitude assessment.

6. To publicize the program.

7. To work cooperatively with other Evergreen Valley College programs, particularly those directed towards women, minorities and economically disadvantaged students.

8. To identify, advise and counsel prospective TTT students.

9. To implement TTT during the spring semester, 1977.

10. To maintain ongoing evaluation of the program process and product by students, staff, administration and industry.

11. To conduct a year-end evaluation of the program.

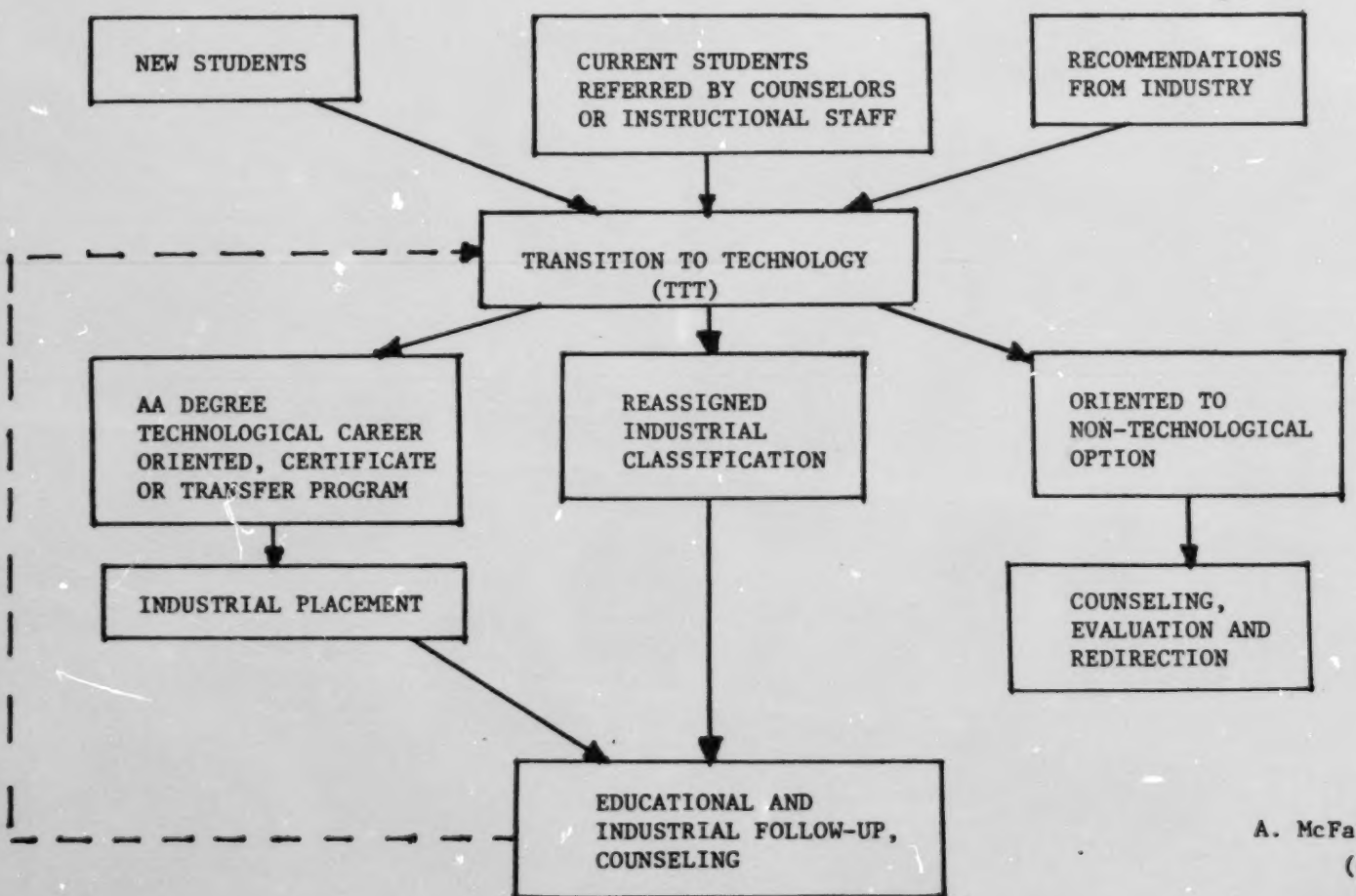
12. To validate and revise the program, as necessary, based on student, faculty, administrative and industry input.

13. To initiate dissemination of information about TTT to other educational institutions.

PROGRAM DESIGN

TTT is designed to provide students recruited from three sources--the community, counselor referrals and industry--with a general exposure to technical education and careers. The intent of TTT is not to direct students into technical programs, but rather to give students the opportunity to understand some general concepts of technology, and to consider whether or not technical education and careers may be of interest to them. Upon completion of the program, students may select from several options. Hopefully, many will choose to pursue a certificate, AA Degree or transfer program in a technical field. Others may decide that they are not interested in technology as an educational or career direction, and may elect to continue their education in other areas. In addition, those students currently employed in a nontechnical area may be reassigned to a technical career field. Chart I outlines the program design for TTT.

CHART I - PROGRAM DESIGN


NEW STUDENTS
CURRENT STUDENTS REFERRED BY COUNSELORS OR INSTRUCTIONAL STAFF
RECOMMENDATIONS FROM INDUSTRY
TRANSITION TO TECHNOLOGY (TTT)
AA DEGREE TECHNOLOGICAL CAREER ORIENTED, CERTIFICATE OR TRANSFER PROGRAM
REASSIGNED INDUSTRIAL CLASSIFICATION
ORIENTED TO NON-TECHNOLOGICAL OPTION
INDUSTRIAL PLACEMENT
COUNSELING, EVALUATION AND REDIRECTION
EDUCATIONAL AND INDUSTRIAL FOLLOW-UP, COUNSELING

A. McFarlin
(4)

PROGRAM CONTENT

Transition to Technology is a one-semester, team-taught, nine hour per week instructional and counseling program. Students earn seven units upon completion. Course content is divided into modules, and methodology includes lecture, small and large group instruction and discussion, speakers from local industry, demonstrations, opportunities for skills development, including hands-on laboratory experience with small projects, and field trips to local industry.

TTT includes two major integrated components:

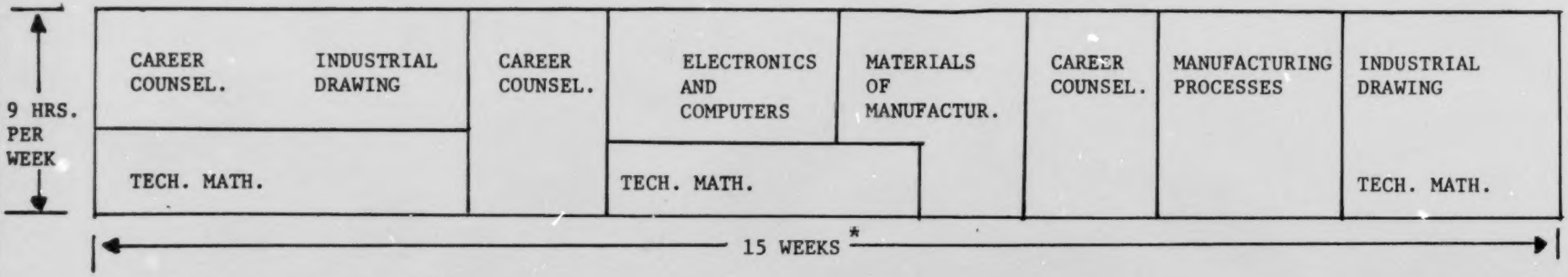
1. The Technical Education Component, consisting of introductory modules in:
   a. Technical mathematics (only as applied to each of the following technical areas)
   b. Industrial Drawing and Graphics
   c. Electronics and Computer Applications
   d. Materials and Manufacturing
   e. Manufacturing Processes
2. Career Advising and Counseling
   a. Initial and ongoing group and individual career counseling sessions
   b. Assessment of interests and aptitudes
   c. Relationship of interest and aptitudes to possible career goals
   d. Investigative study of available technical educational programs and careers
   e. Opportunities for development of job search skills
   f. Referral to campus and community student support services

Chart 1I outlines the TTT components and the initial scheduling arrangement for 1976-77. The revision of this schedule, following evaluation of the initial program offering, will be discussed later.

CHART II

PROGRAM COMPONENTS AND

POSSIBLE SCHEDULING ARRANGEMENT



Tentative Program Schedule

Total Instructional Hours: 135

Component Hours:

Career Advising/Counseling	15 hrs.
Instruction (Lec/Discussion)	75 hrs.
Instruction (Other)	15 hrs.
Laboratory	30 hrs.

*Evergreen Valley College was participating in a State flexible calendar experiment in 1976-77.

(9)

A. McFarlin, 1976

PROGRAM COST

DEVELOPMENT OF THE PROGRAM

The cost of developing the TTT Program was approximately $5,000 for personnel, printing, postage, instructional supplies and travel. As with most programs, the major cost item was for personnel. Staff spent the following number of hours on TTT development:

PERSONNEL COST FOR DEVELOPMENT	HOURS
Program Director	30
Instructional Coordinator	60
Counselor	20
Instructors:	
Technical Math	20
Electronics	15
Industrial Drawing	20
Materials	15
Manufacturing Processes	20
Total	200 hours (average cost of $16/hour = $3,200)

IMPLEMENTATION OF THE PROGRAM

The direct cost of offering TTT for one semester was approximately $4,500. This amount included Program personnel costs, outside speakers and transportation for visits to industry. The cost of textbooks (reusable), workbooks, program evaluation, and preparation of reports was approximately $2,700.

PERSONNEL COST FOR IMPLEMENTATION	TIME SPENT
Program Director	10% of semester salary
Instructional Coordinator	10% of semester salary
Counselor (class time)	7% of semester salary
Instructors:	
Technical Math	30 hours
Electronics	15 hours
Industrial Drawing	15 hours
Materials	15 hours
Manufacturing Process	15 hours

Based on the District salary schedule, the cost of personnel for

instruction and coordination for the program was $3,875 for the seven units of lecture and laboratory instruction for the semester. The cost of individual counseling, testing, etc., was approximately $10 per student. The budget for outside speakers and transportation for five field trips to local industry was $670.

The diverse nature of the curriculum content for TTT created a unique problem related to the cost of textbooks, workbooks and instructional supplies. Since no satisfactory comprehensive overview of technology textbook could be identified, the original intent was to develop the instructional material for each module. However, limited developmental time allowed only for completing the curriculum plan for each module, clarifying the interrelationship of each module to all others and developing a limited amount of instructional materials for each subject area. Books and some instructional supplies were provided through the grant funds, and were returned by students to be issued to new students in subsequent semesters. The cost for books and supplies for 36 students was $1,980.

The cost of program evaluation and other reports was approximately $700.

PROGRAM IMPLEMENTATION

A total of 36 students, the program maximum, enrolled in the initial TTT Program offering in spring, 1977. The only prerequisite required was completion of a simple arithmetic test covering addition, subtraction, multiplication and division. The class ethnic breakdown was 36% Afro-American, 36% Caucasian, 35% Mexican-American and 3% Latin American. There were 18 female and 18 male students. Students were primarily high school graduates, and most were unemployed.

Several pre-program evaluation instruments were administered, including the Student Profile Indicator, Interest and Attitude Survey, Strong-Campbell Interest Inventory, Myers-Briggs Type Indicator, and the verbal reasoning, numerical ability and abstract reasoning, mechanical reasoning, space relations, and spelling components of the Differential Aptitude Test. Results indicated that many students entering the Program possessed anxieties toward mathematics and the handling of equipment. In addition, most students scored low on the numerical ability and abstract reasoning sections of the DAT. (See Appendix C for information on students' mathematics background and math anxiety levels.)

Primary reasons given for enrolling in TTT were to obtain the technical know-how needed to become employable and to receive information on the availability of jobs. (See Appendix D for a complete program evaluation.)

Students worked with a variety of equipment in diverse facilities including the drafting room, Materials Testing Laboratory, and the Manufacturing Processes Laboratory. Students completed several projects in the technical areas. The drafting and mathematics module content was integrated with the project development components so that students worked from the initial design through project completion. For example, students drew the schematic diagrams and printed circuit layout for a transistor radio built in the Electronics module.

In the Materials Testing Laboratory, students worked with impact, torsion, metal hardness, rubber and plastic hardness, and fatigue-test machines; heat-treatment furnaces, a metallographic specimen mounting press, abrasive cut-off wheel, abrasive felt surfacer, specimen polishing wheels, and photomicrographic equipment. In addition, tensile and compression test machines were demonstrated. While studying Manufacturing Processes, students used the following equipment: squaring shears, bar folders, pan brake, universal brake, assorted hand tools and measuring devices, buffing wheels, spot welding machine lathe, drill press, vertical milling machine, and plastic injection molding press.

During the semester, students participated in plant tours to General Electric (Industrial Graphics), Hewlett-Packard (Manufacturing Processes) and Lockheed (Micro-electronics). In addition to the technical exposure, students had the opportunity to participate in discussions with employees regarding different areas of employment. Guest speakers and instructors from industry included women from General Electric, Hewlett-Packard, Finnigan Corporation, Lockheed Missiles and Space Corporation, and Stanford University. Students were given the opportunity to evaluate each field trip. (See Appendix E for a sample evaluation form.)

During the early part of the semester, counselors administered The Occupational Analysis: A Single Job, an instrument designed to assist students in discovering which areas of TTT were of interest to them, and what specific information and education the students would need to pursue a career in areas of interest.

INSTRUCTIONAL COMPONENT

A course development guide was created for instructors to use in developing module content. (See Appendix F.) The following modules and content areas were included in the Transition to Technology Program:

Career Guidance
- Personal Assessment
- Women and Minorities in Science and Technology
- Group Experience
- Winning
- Testing
- Interview Techniques

Manufacturing Materials
- Properties of Materials
- Importance of Properties
- Control of Properties
- Testing of Properties

Manufacturing Processes
- Basic Systems
- Processing Planning
- Production Planning

Technical Mathematics
- Applications to Program technical areas

Industrial Graphics
- Basic Concepts
- Mechanical Drawing
- Project Design

Electronics
- Concepts and Principles
- Fabrication and Assembly

Computer Concepts
- General overview

Appendix G includes sample materials from the TTT modules.

PROGRAM EVALUATION

A comprehensive pre, post, and outside evaluation plan was developed for the Transition to Technology Program. A consultant was hired to assist in the development of the evaluation instruments and to conduct the year-end evaluation. Following is an outline of the pre- and post-evaluation components:

I. Pre-Assessment Evaluation

1. Criteria: Extent to which information about program was disseminated.

   Evaluation: Check list on publicity.

   a) College schedules, bulletins, flyers and posters
   b) newspapers
   c) TV and radio
   d) contacts with industry
   e) counselors
   f) other programs for women and minorities
   g) Career Fair

2. Criteria: Enrollment of 35-40 nontraditional students (women, minorities or economically disadvantaged) in the Transition to Technology Program in spring 1977. Persons entering this program will have little or no exposure to technical career options or will be employed in non-technical positions.

Evaluation: Enrollment Profile obtained by interview or questionnaire.

a) number attending course
b) sex
c) age
d) race
e) educational background
f) marital status
g) number of dependents
h) income
i) previous work history - degree exposure to technical fields
j) head of household
k) special problems
    1) receiving social service assistance
    2) health
    3) transportation
    4) communication or skill deficiencies
    5) home responsibilities - child care, etc.

3. Criteria: Persons entering this program will demonstrate at least minimal initial interest in considering a nontraditional career.

Evaluation:
a) Student questionnaire determining interest and attitude toward technical education and education in general, awareness on career interests and aptitudes, expectations from program, level of self-confidence (pre-test).
b) Career advising and counseling component will administer the following surveys and tests:
    The Bennett Mechanical Test
    Career Search Survey
    Adult Basic Learning Examination

II. Post-Assessment Evaluation

1. Criteria: The successful enrollment of 35-40 nontraditional students.

a) Projection that 70% of the initial enrollees will complete the semester program.
b) Students who complete the program will move into one of the following:
    1) A technical education program (certificate, degree or non-degree).
    2) Industrial on-the-job training programs in technical areas.
    3) Non-technical education programs for students who find themselves disinterested in pursuing a technical career.

Evaluation:
a) attendance rate
b) completion rate
c) placement follow-up - short and long term
d) comparisons of completors and drop-outs to determine what background factors, if any, may be isolated as predictors of vocational choice

2. Criteria: Students increased awareness and understanding of technical concepts and skills development through completion of instructional modules.

Evaluation: Staff will evaluate students by using instructional assessment instruments and observation of students' skills.

Students will evaluate the following components of the program by means of a questionnaire:

a) instructional program, techniques, staff
b) laboratory experiences
c) outside speakers
d) industrial plant visitations
e) counseling and support facilities
f) testing
g) instructional material

Industry will be interviewed with regard to selected components of the program.

3. Criteria: An improvement in students' attitudes toward education in general and technical education in particular through the completion of instructional modules.

Evaluation: Post-test Attitude Survey administered to students to determine changes in interest and attitude toward technical education, awareness of career interests, levels of self-confidence.

Post-test surveys administered by career advising and counseling component.
The Bennett Mechanical Test
Career Search Survey
ABLE

III. Outside Evaluation

1. Planning:
a) comprehensiveness of original plan
b) timetable
c) selection of adequate staff
d) workshops for staff
e) revision of program in accordance with ongoing evaluation

2. Publicity: Checklist of media

3. Selection of appropriate students:

   Profile data and attitude and interest surveys

4. Orientation of students:

   a) Career Fair
   b) Orientation Week
   c) Counseling

5. Implementation of Program:

   a) student, staff, industry opinion surveys on various components of the program to determine strengths and weaknesses
   b) pre and postassessment of students' attitudes, interests and career goals
   c) followup of students attendance and job placement data

6. Budgeting: Proposed budget compared to actual budget

7. Dissemination of Model Instructional Program:

   a) development of package of program information and materials
   b) where disseminated

A copy of the final evaluation is included in Appendix D.

PROGRAM DISSEMINATION

Information on TTT is being disseminated through the following methods:

1. Presentation of information about TTT at appropriate conferences and seminars.

2. Distribution of copies of TTT program information to other institutions upon request.

3. Submission of the TTT Planning and Implementation Report to ERIC.

4. Distribution of TTT information to NEXUS and the American Society for Engineering Education.

5. Submission of TTT information and videotape to the EDC/WEEAP Dissemination Office.

6. Use of the TTT videotape for outreach, recruitment and publicity with industry, high schools and community agencies.

PROGRAM REVISIONS

Based on recommendations from students, program staff and the outside evaluation, the following changes were made in the TTT Program prior to the implementation of the Program in spring 1978:

1. Time allotted for the computer module was expanded from 5 hours to 15 hours. Time allotted for manufacturing materials and processes was decreased, proportionately.

2. Publicity efforts for the spring Program were initiated earlier in the fall of 1977. Brochures were disseminated and all counselors were contacted. The TTT videotape was completed and used in publicizing the Program.

3. Students were recruited to work as peer helpers in the TTT Program. Two of the peers had completed the first offering of TTT.

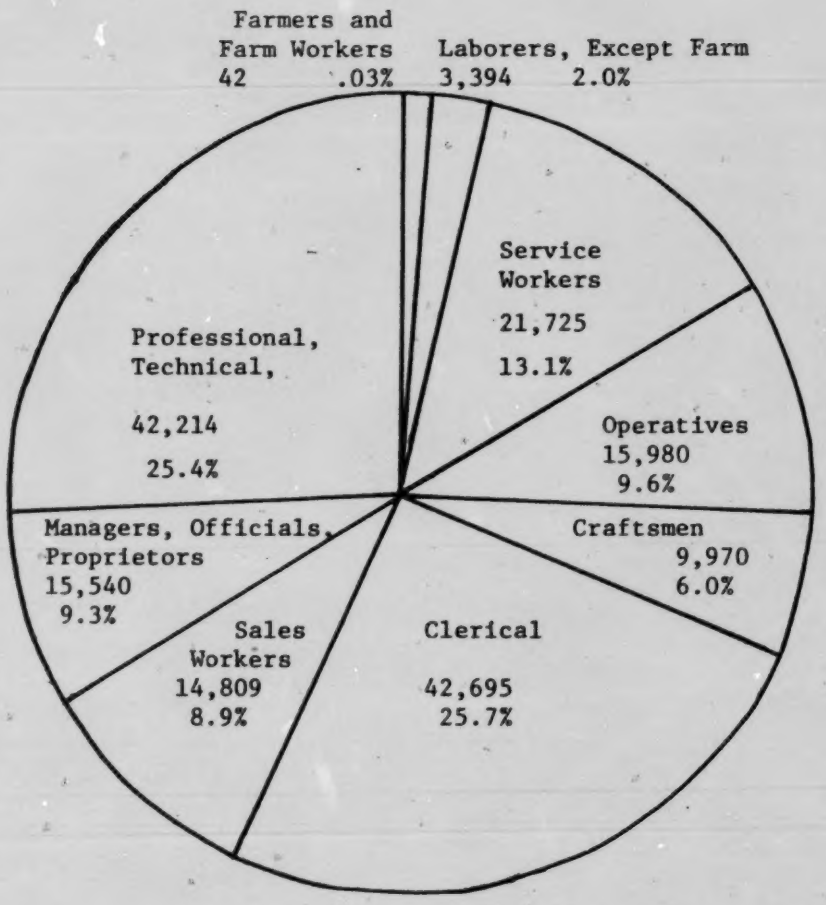
4. A graduate student intern was assigned to assist the TTT Coordinator.

5. The instructional schedule was revised to provide more instructional continuity.

6. The number of aptitude, interest and program evaluation instruments was decreased.

APPENDIX A

PROJECTED DISTRIBUTION OF 166,500 JOB OPPORTUNITIES
AMONG MAJOR OCCUPATIONAL GROUPS
SMSA SANTA CLARA COUNTY 1975-80


Farmers and Farm Workers 42 .03%
Laborers, Except Farm 3,394 2.0%
Service Workers 21,725 13.1%
Professional, Technical, 42,214 25.4%
Operatives 15,980 9.6%
Managers, Officials, Proprietors 15,540 9.3%
Craftsmen 9,970 6.0%
Sales Workers 14,809 8.9%
Clerical 42,695 25.7%

Source: Research Division of the San Jose Employment Development Department, as reported in the Occupational Education Master Planning, San Jose Community College District, Vol. I, April 1976.

APPENDIX B

NUMBER OF DAY, EVENING AND TOTAL STUDENTS, BY SEX, ENROLLED IN SAN JOSE CITY COLLEGE AND DISTRICT OCCUPATIONAL PROGRAMS IN FALL 1974 & SPRING 1975

OCCUPATIONAL TITLE		SAN JOSE CITY COLLEGE AND DISTRICT		
		DAY	EVENING	TOTAL
Food Management Production and Service	(Male)	1	1	2
	(Female)	11	17	28
	(Total)	12	18	30
Accounting	(Male)	223	154	377
	(Female)	205	235	440
	(Total)	428	389	817
Computer	(Male)	1	12	13
	(Female)	0	10	10
	(Total)	1	22	23
Programmers	(Male)	49	32	81
	(Female)	17	25	42
	(Total)	66	57	123
Filing Office Machines	(Male)	11	10	21
	(Female)	66	57	123
	(Total)	77	67	144
Information Communication	(Male)	7	9	16
	(Female)	15	7	22
	(Total)	22	16	38
Educational Assistant	(Male)	30	39	69
	(Female)	14	239	253
	(Total)	44	278	322
Stenographic and Secretarial	(Male)	1	3	4
	(Female)	82	129	211
	(Total)	83	132	215
Public Administration	(Male)	136	185	321
	(Female)	71	53	124
	(Total)	207	238	445
Typing and Related	(Male)	2	3	5
	(Female)	47	23	70
	(Total)	49	26	75
Electronic Technician	(Male)	13	0	13
	(Female)	1	0	1
	(Total)	14	0	14
Engineering	(Male)	197	695	892
	(Female)	9	26	35
	(Total)	206	721	927
Scientific Data Processing	(Male)	0	5	5
	(Female)	0	0	0
	(Total)	0	5	5

NUMBER OF DAY, EVENING AND TOTAL STUDENTS, BY SEX, ENROLLED IN SAN JOSE CITY COLLEGE AND DISTRICT OCCUPATIONAL PROGRAMS IN FALL 1974 & SPRING 1975

OCCUPATIONAL TITLE		SAN JOSE CITY COLLEGE AND DISTRICT		
		DAY	EVENING	TOTAL
Law Enforcement	(Male)	282	676	958
	(Female)	93	112	205
	(Total)	375	788	1,163
Air Conditioning	(Male)	70	118	188
	(Female)	0	1	1
	(Total)	70	119	189
Mechanics	(Male)	172	144	316
	(Female)	2	1	3
	(Total)	174	145	319
Blueprint Reading	(Male)	1	35	36
	(Female)	0	3	3
	(Total)	1	38	39
Carpentry	(Male)	2	660	662
	(Female)	0	4	4
	(Total)	2	664	666
Electricity	(Male)	1	110	111
	(Female)	0	3	3
	(Total)	1	113	114
Construction	(Male)	3	316	319
	(Female)	0	4	4
	(Total)	3	320	323
Drafting	(Male)	86	62	148
	(Female)	13	18	31
	(Total)	99	80	179
Electronics	(Male)	273	638	911
	(Female)	31	83	114
	(Total)	304	721	1,025
Firemanship	(Male)	10	270	280
	(Female)	11	119	130
	(Total)	21	389	410
Machine Tool	(Male)	2	62	64
	(Female)	0	0	0
	(Total)	2	62	64
Cosmetology	(Male)	14	35	49
	(Female)	63	127	190
	(Total)	77	162	239

NUMBER OF DAY, EVENING AND TOTAL STUDENTS, BY SEX, ENROLLED IN SAN JOSE CITY COLLEGE AND DISTRICT OCCUPATIONAL PROGRAMS IN FALL 1974 & SPRING 1975

OCCUPATIONAL TITLE		SAN JOSE CITY COLLEGE AND DISTRICT		
		DAY	EVENING	TOTAL
Fireman Training	(Male)	149	751	900
	(Female)	1	8	9
	(Total)	150	759	909
Millwork and Cabinet	(Male)	1	54	55
	(Female)	0	0	0
	(Total)	1	54	55
Home Furnishing and Equipment	(Male)	0	1	1
	(Female)	0	21	21
	(Total)	0	22	22
Masonry	(Male)	0	60	60
	(Female)	0	0	0
	(Total)	0	60	60
Plastering	(Male)	0	21	21
	(Female)	0	0	0
	(Total)	0	21	21
Plumbing and Pipefitting	(Male)	0	36	36
	(Female)	0	0	0
	(Total)	0	36	36
Metal Working	(Male)	0	59	59
	(Female)	0	0	0
	(Total)	0	59	59
Barbering	(Male)	0	2	2
	(Female)	0	2	2
	(Total)	0	4	4
Refrigeration	(Male)	0	14	14
	(Female)	0	0	0
	(Total)	0	14	14
Stationary Engineering	(Male)	0	16	16
	(Female)	0	0	0
	(Total)	0	16	16
Dry-Wall Installation	(Male)	0	105	105
	(Female)	0	0	0
	(Total)	0	105	105
Glazing	(Male)	0	17	17
	(Female)	0	0	0
	(Total)	0	17	17

STUDENTS COMPLETING OCCUPATIONAL PROGRAMS SAN JOSE CITY COLLEGE FOR 1970 AND 1975 CERTIFICATES AND AA DEGREES

	1970			1975				
PROGRAM	MALE	FEMALE	TOTAL	MALE	FEMALE	AA	CERTI-FICATE	TOTAL
Accounting	6	1	7	2	5	7	0	7
Air Conditioning	0	0	0	4	0	3	1	4
Appren. Elec. Wiring	0	0	0	2	0	2	0	2
Auto Mechanics	8	0	8	16	0	16	0	16
Auto Technician	0	0	0	1	0	0	1	1
Banking & Finance	0	0	0	1	0	1	0	1
Business Data Process.	5	0	5	7	6	7	6	13
Business Adminis.	0	0	0	29	7	36	0	36
Carpentry	0	0	0	1	0	1	0	1
Cosmetology	0	15	15	0	1	1	0	1
Dental Assisting	0	17	17	1	30	31	0	31
Distributive Ed.	21	0	21	0	0	0	0	0
Drafting Tech.	13	0	13	9	1	7	3	10
Early Childhood	0	9	9	0	31	28	3	31
Elec. Tech. & Assembl.	43	0	43	32	16	13	35	48
Engineering Tech.	13	0	13	4	0	4	0	4
Fire Science	23	0	23	71	0	36	35	71
Glazing	0	0	0	1	0	1	0	1
Law Enforcement	21	2	23	41	6	47	0	47
Library Technician	0	12	12	0	0	0	0	0
Machine Technician	1	0	1	0	2	2	0	2
Marketing	0	0	0	31	6	35	2	37
Mechanical Tech.	0	0	0	8	0	1	7	8
Meat Cutter	0	0	0	1	0	1	0	1
Nursing	2	49	51	5	53	58	0	58
Office Operations	1	12	13	0	13	11	3	13
Real Estate	5	3	8	20	3	4	19	23
Secretarial Science	0	13	13	0	6	5	1	6
Teacher's Aides	0	0	0	1	14	2	13	15
Transportation	0	0	0	4	0	4	0	4
Vacuum Tech	3	0	3	0	0	0	0	0
Welding	0	0	0	1	0	0	1	1
TOTAL:	165	133	298	293	200	363	130	493
PERCENT:	55%	45%	100%	59%	41%	74%	26%	

TOTAL GRADUATES: 1970 - 275 AA: 355 AB 630 Total 1975 - 357 AA: 819 AB: 819 Total
OCCUPATIONAL GRADUATES: 1970 - 47.3% 1975 - 60.2%

Sources: 1) CCOE-VE45 Reports 1970, 1975
2) Graduation lists 1970, 1975

APPENDIX C

STUDENT MATH BACKGROUND INFORMATION
TRANSITION TO TECHNOLOGY
Spring 1977

An information sheet on the level of math courses completed was submitted by 28 of the students:

4 were or had enrolled in arithmetic in college.

16 had taken elementary algebra.

5 had taken plane geometry.

5 had taken intermediate algebra.

1 had taken trigonometry.

Fifteen students elected to take two math anxiety tests* after the mathematics test.

4 always have debilitating anxiety.

2 usually have debilitating anxiety.

7 sometimes have debilitating anxiety.

1 rarely has debilitating anxiety.

1 never has debilitating anxiety.

6 sometimes have facilitating anxiety.

5 rarely have facilitating anxiety.

4 never have facilitating anxiety.

*"Debilitating Math Anxiety Test" and "Facilitating Math Anxiety Test," from NLSMA REPORT No. 2, PART A,ed., W. Wilson, L.S. Cohen and E.G. Begle, Stanford, 1968.

APPENDIX D

FIRST SEMESTER EVALUATION REPORT
FOR
EVERGREEN VALLEY COLLEGE
TRANSITION TO TECHNOLOGY PROGRAM

Prepared by
Jeanette Guthart, Consultant

DIRECTED AND EDITED BY
PAUL P. PREISING
DISTRICT DIRECTOR - GRANTS AND RESEARCH
SAN JOSE COMMUNITY COLLEGE DISTRICT

JUNE, 1977

EVALUATION OF PROGRAM

Evaluation of the Transition to Technology Program was carried out under the direction of the San Jose Community College District Director: Grants/Research, Dr. Paul P. Preising. The evaluation included assessment of enrollment data, pre- and post-student surveys, follow-up information on student decisions about educational and occupational choices following participation in the program, and an examination of the extent to which the instructional and attitudinal objectives were met.

The program was evaluated by using the criteria as stated in the grant.

Criteria 1.

"The extent to which information about the program was disseminated through media contacts with industry, brochures, college counselors.

Publicity for the Program was conducted between November 1976 and January 1977. It included public service announcements on radio and television; newspaper coverage; and brochure mailings to female heads of households in the San Jose area and to individuals in San Jose Community College District Women's programs. In addition, the program was presented at a Career Fair and at a nontraditional careers workshop held at the San Jose Y.W.C.A.

Although publicity through the media was quite extensive, most of the students that enrolled in the program learned about it through friends or someone connected with the program. Only 8.3% learned about the program through the brochure and 2.8% through newspaper ads. Recruiting was difficult since the target population was nontraditional students and required much personal contact between the program staff and potential students.

The Transition to Technology Program anticipates fewer problems with recruiting next year since present TTT students are talking positively about the program. The positive feedback will probably serve to attract other students. In addition, a new brochure, thoroughly explaining the program, is now available for Spring 1978 recruiting.

Criteria 2.

"The successful enrollment of 35 to 40 nontraditional students (women, minorities, or economically disadvantaged) in the Transition to Technology Program in Spring 1977. Persons entering this program will have had little or no exposure to technological career options and demonstrate at least minimal initial interest in considering a nontraditional career."

Thirty-six (36) students were enrolled in TTT during the Spring semester 1977. Selection of the students was based on their background as determined by an oral interview and written profile. In addition, the passing of a simple mathematics test was required.

There were 18 females and 18 males in the group.

The ethnic composition of the class was as follows:

Black/Afro American	36.1%
Brown/Mexican American	25.0%
Latin American	2.8%
White Caucasian	36.1%
	100.0%

61.1% had completed 12 years of schooling or more and 8.3% had completed a B.A. degree. Approximately 50% were returning to school after an absence of one or more years. Most were unsure of their career goals, but desired an AA or AB Degree. The two obstacles in the way of schooling, which were expressed most often, were finance and lack of self-confidence. There was a range of incomes varying from 13.9% reporting annual family income of $3,000 or less to 22.2% reporting incomes of $12,001 or more.

TABLE I

STUDENT PROFILE

		#	%
1. Ethnic Background:			
a)	Black/Afro American	13	36.1%
b)	Brown/Mexican American	9	25.0%
c)	Latin American	1	2.8%
d)	White/Caucasian	13	36.1%
		36	100.0%
2. School Years Attended:			
a)	1-7 years	1	2.8%
b)	9-11 years	7	19.4%
c)	12 years	14	38.9%
d)	13 years (1 year college)	11	30.6%
e)	15 or more years	3	8.3%
		36	100.0%
3. Last in School:			
a)	1 year ago or less	17	47.2%
b)	2-3 years ago	5	13.9%
c)	4-6 years ago	1	2.8%
d)	7-12 years ago	10	27.8%
e)	15 years ago or more	3	8.3%
		36	100.0%
4. Currently enrolled in:			
a)	High School	1	2.8%
b)	Adult School	1	2.8%
c)	Junior College	23	63.9%
d)	Trade School	1	2.8%
e)	None	8	22.2%
f)	No answer	2	5.6%
		36	100.0%
5. Diploma/Certificate Received:			
a)	8th Grade	4	11.1%
b)	High School	16	44.4%
c)	GED	6	16.7%
d)	Other	5	13.9%
e)	None	3	8.3%
f)	No Answer	2	5.6%
		36	100.0%

6. Most Recent Occupation:

		#	%
a)	Semi/unskilled	7	19.4%
b)	Skilled	8	22.2%
c)	Prof/Tech	5	13.9%
d)	Student	8	22.2%
e)	Homemaker	3	8.3%
f)	No answer	5	13.9%
		36	100.0%

7. Presently Employed:

		#	%
a)	yes	7	19.4%
b)	no	27	75.0%
c)	no answer	2	5.6%
		36	100.0%

8. If Employed, Hours Worked?

		#	%
a)	15 to 25	2	5.6%
b)	26 to 35	2	5.6%
c)	36 or more	5	13.9%
d)	Does not apply	24	66.7%
e)	No answer	3	8.3%
		36	100.0%

9. Career:

		#	%
a)	Not sure	21	58.3%
b)	Occupational	5	13.9%
c)	Professional	10	27.8%
		36	100.0%

10. Education Desired:

		#	%
a)	AA (2 year college)	14	38.9%
b)	BA (4 year college)	11	30.6%
c)	Not sure	10	27.8%
d)	No answer	1	2.8%
		36	100.0%

11. Tutoring Desired

		#	%
a)	Yes	7	19.4%
b)	No	10	27.8%
c)	Maybe	15	41.7%
d)	No answer	4	11.1%
		36	100.0%

12. Obstacles In The Way of Schooling:

		#	%
a)	Time	2	5.6%
b)	Finance	8	22.2%
c)	Transportation	5	13.9%
d)	Child Care	3	8.3%
e)	Lack of Self-Confidence	7	19.4%
f)	No answer	11	30.6%
		36	100.0%

13. Veteran:

	#	%
a) Yes	8	22.2%
b) No	26	72.2%
c) No Answer	2	5.6%
	36	100.0%

14. Do You Live:

	#	%
a) By yourself	5	13.9%
b) With parents	10	27.8%
c) With spouse	9	25.0%
d) With friends	4	11.1%
e) With other	8	22.2%
	36	100.0%

15. Dependents:

	#	%
a) None	11	30.6%
b) 1 (self)	9	25.0%
c) 2-3	11	30.6%
d) 4-6	3	8.3%
e) 7-10	1	2.8%
f) no answer	1	2.8%
	36	100.0%

16. Annual Family Income:

	#	%
a) $3,000 or less	5	13.9%
b) $3,001 - $4,000	5	13.9%
c) $4,001 - $6,000	1	2.8%
d) $6,001 - $9,000	2	5.6%
e) $9,001 - $12,000	2	5.6%
f) $12,001 - or more	8	22.2%
g) Unavailable	13	36.1%
	36	100.0%

17. Learned About TTT Program From:

	#	%
a) Saw brochure	3	8.3%
b) Called college and asked	1	2.8%
c) Friends	10	27.8%
d) From someone in program	10	27.8%
e) Newspaper	1	2.8%
f) Other	9	25.0%
g) No answer	2	5.6%
	36	100.0%

18. Language:

	#	%
a) Bilingual	4	11.1%
b) Spanish only	1	2.8%
c) English only	31	86.1%
	36	100.0%

19. Sex:

	#	%
a) Male	18	50.0%
b) Female	18	50.0%
	36	100.0%

Criteria 2a.

"Projection that 70% of the initial enrollees will complete the semester program."

As of March 1977, 11 students (30%) were dropped from the course due to poor attendance. These students were followed up by telephone interviews and asked the following questions:

1. What was your reason for withdrawing from the TTT program?
2. What was your opinion of the TTT program?
3. Have you been employed this semester?
4. Do you plan to return to Evergreen Valley College next semester?

The major reasons given for withdrawal from the program were due to personal and family problems (4); work/schedule problems (2); poor health (1); and lack of transportation (1). According to instructors, three students had entered technical employment before the end of the semester. Three students could not be contacted since they had no telephone or forwarding address listed. The majority of those who dropped from the course were not employed (7), and six of these planned to return to Evergreen Valley College or school next semester. In general, the "non-completors" said that the program was interesting, but that their personal/family problems or work interfered with their school attendance.

No significant difference was found between the demographic background of the "non-completors" and the "completors." One possible inference from the data is that those with more years of schooling tend to complete while those with less do not. Another interesting response is that more "non-completors" had an educational goal of a BA, whereas, more "completors" had an educational goal of an AA.

Criteria 2b.

"Students who complete the program will move into one of the following":

1. "A technical education program certificate, degree or non-degree."
2. "Industrial on-the-job training programs in technical areas."
3. "Non-technical educational programs for students who find themselves disinterested in pursuing a technical career."

Student's career goals and plans for next semester were obtained on a post-survey. The majority of students surveyed intended to take more courses in a technical education program (41.2%) or obtain a job in a technical field (17.6%). (17.6%) decided to continue college but not in a technical field and (17.6%) were undecided about their plans for next semester. Asked whether they decided on a definite career choice (41.2%) said yes, (29.4%) said no and (29.4%) were undecided. Some examples of career choice were electronics technician, draftsperson and computer operator.

Criteria 3a.

"Completion and implementation of instructional modules."

1. "The instructional components will be evaluated through pre and post assessments of student attitudes towards education in general and technical education in particular. Students will provide written evaluations of the instructional program, techniques and staff. Other instructional areas to be evaluated will include the number and variety of technical experiences, outside speakers, non-traditional role models, and industrial plant visitations to which students are exposed."

Critieria 3b.

"Student awareness and understanding of technical concepts and skills development will be evaluated on an on-going basis through instructional assessment instruments and individual student demonstrations of technical skills acquired through the program."

A. PRE-ASSESSMENT STUDENT SURVEY

A pre-assessment student interest and attitude survey was conducted during the first week of the semester. The majority of students stated that their most important reason for enrolling in TTT was to become employable (30.5%) and to gain information about technical fields (38.9%) The kinds of skills and information the students wished the program to provide included career information, and basic technical knowledge and skills. Many students expressed a concern about working with mathematics (25.0%), equipment (12.5%) and understanding the work (17.9%). Most of the students felt their family had positive feelings about their enrollment in TTT. 50% of the students had a good or excellent experience in school previously, 61% felt confident about enrolling in TTT, while 25% stated that they were anxious or frightened.

TABLE 3

INTEREST AND ATTITUDE SURVEY

1. Most important reason for enrolling in TTT:

		#	%
a)	To become employable	11	30.5%
b)	To become a skilled technician	4	11.1%
c)	To gain information	14	38.9%
d)	To obtain a better position	3	8.3%
e)	Introduction to school	2	5.6%
f)	No answer	2	5.6%
		36	100.0%

2. Kinds of information and skills, students wish the program to provide:

A. Career Information

		#	%
a)	Availability of technical job	6	13.3%
b)	Job duties	4	8.9%
c)	Job requirements	4	8.9%
d)	Planning for technical job	3	6.7%
e)	Applying for a position	3	6.7%
f)	Decision making	2	4.4%
B.	Basic Technical Knowledge and Skills	8	17.8%
C.	Specific Knowledge		
a)	Engineering	2	4.4%
b)	Electronics	5	11.1%
c)	Keypunch	1	2.2%
d)	Mathematics	1	2.2%
e)	Machines	1	2.2%
f)	Manufacturing	1	2.2%
g)	Drafting	1	2.2%
h)	Laser	2	4.4%
i)	Computers	1	2.2%
		45	99.8%

3. Unusual concerns connected with enrolling in TTT:

		#	%
a)	Handling school work and housework	1	1.8%
b)	Re-entering school	4	7.1%
c)	Understanding the work	10	17.9%
d)	Working with equipment	7	12.5%
e)	Using Mathematics	14	25.0%
f)	Working in what is considered a male field	4	7.1%
g)	No concerns	11	19.6%
h)	No answer	4	7.1%
i)	Entering an unknown situation	1	1.8%
		56	99.9%

4. Quality of last experience in school:

		#	%
a)	Excellent	6	16.7%
b)	Good	12	33.3%
c)	Average	15	41.7%
d)	Poor	2	5.6%
e)	Very poor	0	0.0%
f)	No answer	1	2.8%
		36	100.0%

5. Other people's feeling about enrollment in TTT:

		Positive	Neutral	Negative
a)	Husband/Wife	6	5	
b)	Children	12	4	
c)	Mother	10	3	1
d)	Father	9	5	
e)	Friends	12	7	
f)	No comment	4		

6. Are members of family or close friends employed in a technical field?:

		#	%
a)	Yes	16	44.4%
b)	No	19	52.8%
c)	No answer	1	3.8%
		36	100.0%

7. Feeling right now about your enrollment in TTT:

		#	%
a)	Very confident	7	19.4%
b)	Confident	15	41.7%
c)	Neutral	4	11.1%
d)	Anxious	7	19.4%
e)	Scared	2	5.6%
f)	Interested	1	2.8%
		36	100.0%

B. MID-SEMESTER STUDENT SURVEY

A mid-semester evaluation survey was conducted in March 1977. Twenty students responded to the survey. Here again, students expressed career exploration as the main reason for taking the TTT course. Practically everyone agreed that they liked studying a variety of subjects (95%) and having several instructors in one course (100%). The great majority of students felt that TTT lived up to their expectations (70%).

Relating to what the students liked about TTT, almost everyone (85%) stated that they liked the variety of material offered, exposure to new things, career guidance testing, guest speakers and laboratory work. Typical comments were as follows:

> "I like the diversity, I like the speakers from industry, and I like doing a lab which makes it super."
>
> "Each class has something new for me."
>
> "The total concept, covering several subjects which are interrelated. I also like the career guidance testing. Guest speakers are interesting and offer needed variety."
>
> "I think it is great to get an overall view so you don't waste semesters finding the place where you want to go."
>
> "It is introducing me to a lot of new things I was never exposed to before."

Responding to the question, what do you dislike about the TTT Program, five (5) people said that the components were too spread out and they were having difficulties remembering from one class to another. They preferred greater continuity, with a concentrated block of time for each component rather then having a variety of subjects in one week. Two student stated they would like textbooks earlier in the semester; six students responded that class time was boring because time was wasted by other students being apathetic or by

instructors repeating directions and "taking care of People."

TABLE 4

MID-SEMESTER STUDENT SURVEY

1. Number of units taken during the semester:

		#	%
a)	7 - 10	5	25.0%
b)	11 - 14	12	60.0%
c)	15 - 18	3	15.0%
		20	100.0%

2. Age

		#	%
a)	20 or less	2	10.0%
b)	21 - 25	5	25.0%
c)	26 - 30	3	15.0%
d)	31 - 35	5	25.0%
e)	36 - 40	1	5.0%
f)	41 - 45	2	10.0%
g)	46 - 50	2	10.0%
		20	100.0%

3. College Major

		#	%
a)	Engineering	2	10.0%
b)	Business	1	5.0%
c)	Park Management	1	5.0%
d)	Physiology	1	5.0%
e)	Art	1	5.0%
f)	General Education	1	5.0%
g)	Undeclared	13	65.0%
		20	100.0%

4. Reasons for taking course - (Statement by individuals):

"I wanted to find out if I would enjoy working in one of the fields presented to us."

"I want the introduction to the various courses."

"I want information about computers and what goes on in the manufacturing business world."

"Curiosity, I was told that this class would lead to a better future."

5. I like studying a variety of subjects in one course:

		#	%
a)	Yes	19	95.0%
b)	No	1	5.0%
		20	100.0%

6. I like having several instructors in one course:

	#	%
a) Yes	20	100.0%
b) No	0	0.0%
	20	100.0%

7. The TTT Program is living up to my expectations:

	#	%
a) Yes	14	70.0%
b) No	5	25.0%
c) No answer	1	5.0%
	20	100.0%

If no, why?

"Not well organized."

"Moves too slowly."

"Not enough material in my field of interest."

"Classwork duplicates what's done outside of class."

8. What do you like about the TTT Program?: (Statements by individuals):

"It is introducing me to a lot of new things I was never exposed to before."

"The total concept, covering several subjects which are interrelated. I also like the career guidance testing. Guest speakers have been interesting and offered needed variety."

"The variety of course material and what is covered."

"Each class has something new for me."

"The teachers are very interesting or should I say they make the class interesting."

9. What do you dislike about the TTT program?: (Statements by individuals):

"Instructors take too much class time "taking care of people" - repeating for people who came in late; more information than is necessary about finding offices; etc. I would like to spend more class time on the course material and not duplicate what is in the texts unless it is unclear."

"At present, lack of organization in some areas."

"Parts are extremely boring."

"The scattering of the courses. I prefer more continuity. Example: Three weeks concentrated math - three weeks concentrated material lab, three weeks manufacturing lab and 3 weeks graphics. I am having difficulty remembering what was done from one class to the next."

"I think it should be broken down in definite sections. Certain classes are too scattered. It should cover one section until done and then go on to the next one."

"Loose organization."

C. FIELD TRIP SURVEYS

Field trips were made to General Electric, Hewlett-Packard and Lockheed. In general, field trips were very highly regarded by the students. Almost everyone stated that they learned things that were not covered in class; that the speakers were interesting, informed, helpful and understandable. Most felt that the field trips helped them make decisions relating to their job choice.

D. POST-STUDENT SURVEY

A post-student survey was completed by 17 students during the last week of the semester. The majority of students stated that their most important reason for attending the TTT Program was to gain information about technical fields (47.1%). Most felt that TTT met their needs fully (41.2%) or partly (47.1%). Only 11.7% said that TTT did not meet their needs. As a result of the program, the majority of participants intended to further their education in a technical course (41.2%) or obtain a job in technology (17.6%). 17.6% decided to continue college, but not in a technical field.

As to their opinion of the program, students rated the laboratory experience (70.6%), field trips (71.2%), outside speakers (47.1%) and the electronics component (58.8%) and materials component (47.1%) as excellent. The rest of the technical components, and the quality of teaching was given a satisfactory rating. 23.5% of the students rated the counseling component, technical mathematics component and the organization of the course as poor.

Almost all the students agreed with the statements that they had gained a greater understanding of technical ideas (94%) skills (88.2%) and a broader view of career choices (100%). They also felt that there were career opportunities available for women (88%) and minorities (84%) in technical fields. The greatest (64.7%) number of students felt that they had improved their self-confidence and their attitude toward working in a technical field (58.8%);

however, there were a few students who disagreed with these statements. When asked what they like most about the TTT course some of the answers which were representative were as follows:

"I liked getting a first hand look at many trades at one time."

"I liked seeing career opportunities for minorities in technical fields."

"Broad range of subject matter; laboratory work, making things, doing things."

"Had a chance to learn about fields completely foreign to me."

Responding to what they liked least about the course, organization and scheduling of courses was mentioned. Students complained about attending courses away from Evergreen Valley College Campus at San Jose City College and San Jose State University. This apparently caused transportation difficulties and scheduling problems, if they were attending other classes. The other problem concerning organization was that students preferred covering one field of technology at a time in more depth rather than interspersing them. A complaint concerning the counseling component was that there was too much standardized testing.

When asked what they wished could have been included, participants suggested more and shorter field trips, and more electronics and laboratory work.

The electronics component was rated as the most useful, enjoyable, and easiest section. The technical mathematics component was viewed by half the class as being the most difficult and by half as being the easiest. This reflects the wide range of mathematical ability which was present in this class. Materials/manufacturing was rated as the least useful to the students of the components although it was given an excellent or satisfactory rating in a previous question pertaining to quality of instruction.

As to whether the students had decided on a definite career choice, 41.2% replied yes, 29.4% said no, and 29.4% were undecided.

E. STAFF AND INDUSTRY'S EVALUATION

The staff met on a bi-weekly basis throughout the semester to discuss problems and implement changes. At the end of the semester, the staff participated in a written evaluation of the Program and held a meeting to review suggestions. Highlights of the results of the written evaluation are detailed below:

1. Strengths of the Program (Question #1)

As to the strength of the Program, the staff unanimously agreed that TTT serves an important community need. The program exposes students who ordinarily would not consider a technical career to broader career opportunities. Non-traditional students are aided in overcoming some of their apprehension in using tools and machinery and they are encouraged in a pressure free atmosphere. The Program offers a diverse experience and uses role models that women and minority students can identify with. The student gets a chance to see and relate to actual job situations through industrial plant tours. The staff was enthusiastic and sensitive to the needs of non-traditional students.

2. Areas of the Program Needing Improvement (Question #2)

In seeking to improve TTT for the coming years, the second question concerned program weaknesses. In some respects the problems were not unlike those in traditional classes. The staff felt that the program did not provide for the great diversity in students' background, capabilities and experiences. The greatest problem was associated with the difficulties encountered by the staff in motivating and supporting the non-traditional student, and at the same time stimulating and interesting the more advanced student.

A second problem area dealt with the organization and scheduling of the components. The staff agreed that giving the Program on three different campuses, San Jose City College, Evergreen Valley College, and San Jose State University caused scheduling conflicts and transportation problems for the students. However, the rational for using the off-campus facilities was that it provided the most efficient use of the available staff and necessary facilities.

Concerning the organization of the course, many of the instructors felt that it would be better to have concentrated units in each subject area for a length of time rather than alternating the components during a week. There was a need expressed to have less fragmentation of the components and to cover a lesser amount of material in greater depth.

The counselors stated their concern that there were too many standardized tests which left little time for personal contact, interview sheets and career search techniques.

3. Recommendation for Additions and/or Changes (Question #3)

There were several ideas as to how to handle the diverse range of students' abilities. One was to use average and above average students who understood the content areas as peer helpers or tutors. Another was to divide the group into ability levels (particularly in math) and individualize instruction. Suggestions were made to follow-up students early in the semester and provide aid when necessary.

Recommendations for changes in the course organization included having intensive sessions in each subject area rather than intermixing subjects. It was suggested that the components cover less material in greater depth and be more interdisciplinary in nature. Courses should be given on one campus and some were of the opinion that an evening course might be appropriate for some time in the future.

As for the testing, the counselors suggested that just the DAT and Strong Campbell Interest Inventory be used at the beginning of the semester. They wanted more time scheduled for personal contact with the students and "informal discussion sessions," where students could view their concerns.

The staff unanimously agreed that the program was worthwhile and should continue next year with the addition of the suggested modifications. (See Appendix E for Staff Evaluation Instrument and Results.)

4. Industry's Opinion

Interviews with the people from industry who participated in the program, indicated that all were impressed with the Program. They found the students to be enthusiastic and eager to learn about careers and opportunities in technology. Hewlett-Packard has expressed interest in developing an evening program, to upgrade employee skills.

5. "The career advising and counseling component will participate in evaluation by administering assessment, interest and aptitude group and instrument, individual interviews, and the following surveys and tests":

The Bennett Mechanical Test (pre and post).

Career Search Survey (pre and post).

Able (Adult Basic Learning Examination). (pre)

SSHA (Survey of Study Habits and Attitudes). (pre and post)

The counseling component experienced difficulties in obtaining the above tests in time for the beginning of the semester. The Differential Aptitude Test (pre and post test) and the Strong Campbell Interest Inventory were substituded.

Results of the Differential Aptitude Test (pre-test) showed a wide range in student ability, from the first percentile to the 95th percentile. The skills measured were space relations, mechanical reasoning and numerical ability. The mean group scores for these various skills ranged from the 20th percentile to the 35th percentile.

Viewing the results of the DAT, there does not appear to be a great difference in scores for women or men in the group nor for "completors" and "non-completors." However, there appears to be a difference in scores obtained by racial groups. The Black and Mexican-American group scored in the two lowest quartiles; whereas the caucasian group scores placed in all four quartiles. Caution must be exercised in interpreting these results, since there were so few students taking the test and the test might be culturally biased. Further studies should be made of these tests when they are used for the following semester.

Post tests on the DAT tests were given during the last week of the semester to see if there were any improvement in scores. The scores are still being analyzed and data will not be available until September.

Students were individually counseled as to the results of their DAT's and Strong Campbell Interest Inventories. Counselors helped the students interpret their scores and define their career interests.

6. "Dissemination and utilization will be evaluated by the following":

a. Development of program and instructional modules:

The Project administrator, director, and the instructional coordinator met between June 1976 and September 1976 to refine the design of the TTT program and to select instructors. The instructors who participated in this program were sensitive and aware of the needs

of non-traditional students and demonstrated enthusiasm in participating in the program.

During September 1976 - January 1977 the staff developed instructional modules and established contacts with representatives from industry. The instructional coordinator and director of the Program did an outstanding job scheduling ten other instructors, including counselors, six guest speakers and three field trips to industry. In the future, it is recommended that two hours per week coordination time be scheduled along with coordinator's instructional hours.

Meetings were held regularly throughout the year to plan, implement and evaluate the Program. However, staff attendance at these meetings was often spotty due to the difficulty of setting a meeting time which fit in with everyone's schedule.

On the whole, the program was well planned and executed.

b. "Communication with appropriate institutions and organizations to determine interest in previewing package."

A career education and instructional microfiche package is currently being assembled. It will contain program material including resource tests, surveys, assessment instruments, career information, bibliographies, handouts and module materials. Appropriate institutions and organizations will be contacted so that the package may be disseminated.

Several educational institutions have already written requesting information on TTT.

7. Long Term Evaluation

A six month and one year follow-up of TTT students will be conducted to determine their educational or occupational goals and to assess students' retrospective opinion of the program.

One of the features of the TTT Program was to promote the idea of helping students acquire an exposure to technical fields. An additional expectation was that some students would continue in the technical course content area. The idea that a student would secure employment was not necessarily an expected outcome; however, students both took technical courses and secured employment in the technical areas.

Follow-up of the 36 persons enrolled in the initial TTT Program showed that nine (9) students enrolled in a variety of technical courses:

Course	Students
Engineering Technology 109 (Manufacturing Processes)	2
Drafting 103 (Electronics Drafting)	2
Drafting 10 (Basic Drawing)	1
Engineering 1 (Technology & Society)	2
Electronics (Introduction to Electronic Concepts)	2

In addition, three students secured employment in technical areas.

V. CONCLUSION

The Transition to Technology Program can be considered highly successful. It met its goal of exposing nontraditional students to career options in technical fields. It has helped to increase the faculty's and industry's awareness of the need to provide opportunities for women and minorities in

technical fields. As a result of the program, students have gained a greater understanding of technical ideas and skills and a broader view of career choices. Although it is too early to say whether TTT students will actually be helped in obtaining jobs in technical fields, the indication is that many of them were motivated to continue their education in a technical program.

TTT provides an important community service by giving the nontraditional student an opportunity to explore career options available in technological fields and hopefully increase their chances for employment in these fields.

VI. RECOMMENDATIONS

Based upon student, staff and industry's input, the evaluator recommends that the Program be continued for the Spring 1978 semester.

TTT is an experimental program and, as such, it will undergo growth and modification. The success of the Program depends upon its flexibility and ability to meet the needs of the students being served.

The following modifications are recommended for the Spring 1978 program:

1. Recruiting and Selection of Students

Publicity for the Program should begin early (October 1977). Although information about the Program should be disseminated through regular channels (media, industry, counselors, college brochures, etc.) it would be desirable to use former enthusiastic TTT students as recruiters at a "Program Open House" and at career fairs. One approach to the selection of students would be to screen candidates so that they meet a minimum reading, intelligence and math skill level. Students who do not qualify because of a lack of academic skills can be directed to a remedial reading or math class before entering the program. Another approach would be to have no entrance requirements concerning skills levels but to provide students with tutoring help when necessary.

2. Diversity of Student Ability

Since TTT is designed for students from all kinds of backgrounds, it must meet the challenge of providing for diversity. Wide ranges in student ability can be dealt with in several ways. One way would be to use more able students in the class as peer helpers and tutors. This has the advantage of bringing the class together as a supportive unit where people get to know each other on a personal level as well as providing academic help.

Another suggestion would be to divide the group into ability levels and provide more individualized instruction. This would be especially useful in Technical Math and in laboratory work.

The problem of maintaining high academic standards in the course, and at the same time having a pressure free atmosphere, needs further exploration. Since this is a seven unit course, with no tests given and grading on a pass or fail basis, it is important that students realize that they must attend class regularly and be committed to the Program.

Follow-up of absent or unmotivated students should begin early in the semester and aid should be provided for students experiencing difficulties. Informal "talk sessions" between instructors and class should help in keeping morale high and uncovering problems.

3. Organization and Development of Course Content

There would be greater continuity for the students, if the technical components were given in concentrated blocks of time rather than interspersed with each other. However, the counseling component should meet each week. Students might be given a choice as to which technical component they wanted to explore in depth after they had a brief exposure to all of the components. The selection of appropriate textbooks and material for the course will need further exploration since there is a scarcity of good material for such a course. Most of the texts did not portray women or minorities as role models

and the majority of students found the texts too difficult. It has been suggested that a District produced and instructor written syllabus be used for future TTT courses. The laboratory experience, field trips and outside role models were excellent and should be continued.

4. Scheduling of the Course

Whenever possible, the course should be held on the Evergreen Valley College Campus to eliminate problems in transportation and scheduling. Late afternoon or evening hours might be considered as a possible time for holding the class, since this time frame might be more convenient for the target population. Another possibility would be to schedule early morning courses.

5. Student Contact and Counseling

More informal student contact is needed between the staff and students. A smaller class (20) would be easier to handle. Time should be scheduled in the curriculum for student and staff to express their views.

There appears to be a need for less standardized testing and more counselor contact. A search needs to be made for a standardized test that can help predict success for a nontraditional student in a technological course.

The Transition to Technology Program is off to an excellent start and can provide an extremely valuable service to the community, if it continues to be innovative and flexible.

1. Program Schedule

PAGE(S) 50 WAS ([redacted]) [redacted] (REMOVED) FROM THIS DOCUMENT PRIOR TO ITS BEING SUBMITTED TO THE ERIC DOCUMENT REPRODUCTION SERVICE.

1. Interest and Attitude Questionnaire

2. Mid-Semester Survey

3. Post-survey

INTEREST AND ATTITUDE QUESTIONNAIRE

Directions: Please place a check mark ✓ in space provided or fill in answer where appropriate.

1. What is your most important reason for enrolling in the Transition to Technology program?

   _____.

2. What kinds of information would you like the program to provide for you?

   _____

   _____.

3. What kind of skills would you like the program to provide for you?

   _____.

4. Do you have any unusual concerns connected with enrolling in the TTT program such as:

   a) handling school work and housework____

   b) re-entering school_____ c) understanding the work_____

   d) working with equipment____ e) using mathematics_____

   f) working in what is considered to be a male field_____

   g) no concerns_____ h) other (please state)_____

   _____.

5. How would you rate the quality of your last experience in school or college?

   a) excellent_____ b) good_____ c) average_____ d) poor_____ e) very poor____

6. How do the following people feel about your enrollment in a technical program (Please check appropriate response after each person.)

	Positive	Neutral	Negative
a) Hushand (Wife)	_____	_____	_____
b) Children	_____	_____	_____
c) Mother	_____	_____	_____
d) Father	_____	_____	_____
e) Friends	_____	_____	_____

   f) Other comments _____.

7. Are members of your immediate family and/or close friends employed in a technical field?

   a) yes_____ b) no_____

8. What are your feelings in general right now about your enrollment in Transition to Technology?

   a) Very Confident_____ b) Confident_____

   c) Neutral_____ d) Anxious_____ e) Scared_____

TRANSITION TO TECHNOLOGY PROGRAM

STUDENT SURVEY

1. I am taking _____units this semester.

2. My age is _____.

3. My college major is _____.

4. I am taking this course because _____

_____

_____

5. I like studying a variety of subjects in one course.

yes _____ no _____

If no, why? _____

_____

_____

6. I like having several instructors in one course.

yes _____ no _____

If no, why? _____

_____

7. The TTT Program is living up to my expectations.

yes _____ no _____

If no, why? _____

_____

8. What do you like about the TTT Program?

_____

_____

9. What do you dislike about the TTT Program? _____

_____

10. I would like to add these comments about the TTT Program.

_____

_____

_____

_____

Return to Instructor.

March 4, 1977

TTT STUDENT POST-SURVEY

NAME _____

ADDRESS _____

_____

Phone no. _____

- -

1. What was your most important reason for coming to the TTT Program? (CHOOSE ONE)
   _____To prepare for a job in a technical field.
   _____To explore my interests.
   _____To gain information about technology.
   _____Other (please state) _____

2. Did TTT meet your needs?
   _____yes _____partly _____no

3. As a result of being enrolled in the TTT Program, what are your plans for next semester?
   _____Take more courses in a technical education program.
   _____Obtain a job in a technical field.
   _____Continue college, but not in a technical course.
   _____Obtain a job, but not in a technical field.
   _____Obtain a position in "on the job training program."
   _____Undecided
   _____Other (please state) _____

_____

4. Please rate the following according to your TTT experience.

	Excellent	Satisfactory	Poor	Don't Know
Quality of teaching	_____	_____	____	_____
Laboratory work	_____	_____	____	_____
Field trips	_____	_____	____	_____
Counseling	_____	_____	____	_____
Organization of course	_____	_____	____	_____
Outside speakers	_____	_____	____	_____
Technical Mathematics	_____	_____	____	_____
Industrial Drawing	_____	_____	____	_____
Electricity/Electronics	_____	_____	____	_____
Materials/Manufacturing	_____	_____	____	_____

5. Please say whether you agree or disagree with the following sentences by placing the best letter in the space after each sentence.
   a. Highly agree
   b. Agree
   c. Disagree
   d. Highly disagree
   e. Don't know

   I have gained a greater understanding of technical ideas. _____
   I have gained a greater understanding of technical skills. _____
   I have gained information about job opportunities in technical fields. _____
   My attitude toward working in a technical job has improved. _____

TTT has helped me to decide on a career or vocational goal. _____
I feel more positive about a career in a technical field. _____
I feel that there are career opportunities available for women in technical fields. _____
I feel that there are career opportunities available for minorities in technical fields. _____
TTT gave me a broader view of career choices. _____

6. What did you like best about the TTT Program?

7. What did you like least about the TTT Program?

8. What did you wish could have been included?

9. Which section of the TTT Program (Technical Mathematics, Industrial Drawing, Electronics, Materials/Manufacturing, Computers) was

The most difficult? _____

The easiest? _____

The most enjoyable? _____

The most useful to you? _____

The least useful to you? _____

10. Have you decided on a definite career or vocational choice?

Yes _____ No _____ Undecided _____

If yes, what is it? _____

We have enjoyed your participation in this program. We would appreciate any other comments you might have.

OTHER COMMENTS OR RECOMMENDATIONS

TTT STAFF EVALUATION

1. What are the strengths of the TTT Program?

2. What are the weaknesses of the TTT Program?

3. What recommendations for additions and/or changes do you have?

4. Please rate the overall quality of the following:

		Excellent	Satisfactory	Poor	Don't Know
a.	Student interest				
b.	Lab experience				
c.	Field trips				
d.	Organization of courses				
e.	Student ability				
f.	Time/location of course offerings				
g.	Instructional materials, (texts, films, equipment)				
h.	Facilities				
i.	Budget				
j.	Program content of Technical Education Component				
k.	Career Advising & Counseling Component				
l.	Evaluation Component				
m.	Other (please state)				

5. Do you think the program should be continued next year? Why or why not?

6. Other comments

STAFF EVALUATION

Strengths of TTT Program

"It helps students to decide which career to pursue by exposing students to various vocational areas."

"It exposes the student who would probably not consider the areas of technology except through such a program."

"Allows minority students to explore various technical courses in enough depth to facilitate the decision making process."

"Staff enthusiasm."

"Teaching quality."

"Offers diverse experiences utilizing team teaching and role model instruction."

"Doesn't place student in pressured situation."

"Helped students overcome some of their apprehension in using tools and machinery."

Weaknesses of Program

"Student ability too diverse in one class."

"Too many units for too little student work - possibly a free ride for many." "Too weak for a "true" college level course."

"It covers too much."

"Too many students absent (not motivated enough)."

"Organization of instructional components too divided."

"Lack of student follow-up."

"Need provisions for more individualized student contact."

"Disparity in capability of students bored some - others felt lost."

"Program organization did not provide for diversities in student's backgrounds and experiences."

"Students seem to feel they needed more time in some areas."

Recommendations for additions and/or changes

"Recommend accepting second semester students with a minimum GPA (2.25) and well defined math and reading skill levels. Accelerate coverage of topics and increase depth. Plenty of homework and testing."

"Just use DAT and Strong Campbell for testing by counselors. Limit admittance to students of similar math ability. Less testing and more time with interview sheets and career search reports."

"Screening procedures need to be revised."

"All classes should be held on EVC campus."

"Better coordination of components. More of an interdisciplinary nature."

"More peer helpers."

"Staff meetings with entire staff."

"Cover complete area rather than intermixing teaching components."

"Periodic bull sessions should be scheduled with students."

"Less fragmentation in math component."

"I would like 9 hours to teach drafting instead of 6."

Quality of TTT Program

	Excellent	Satisfactory	Poor	Don't Know
Student interest	4	3	1	
Laboratory experience	3	2		1
Field trips	4			2
Organization	1	4	1	1
Student ability	1	2	4	
Time/location		3	1	3
Instructional materials	1	4		1
Facilities	3	4		
Budget	1	5		1
Program content	2	2		1
Career advising	1	1		3
Evaluation	1	2		2

Should the program be continued next year?

Yes 7
No -

Additional Comments

"Some students displayed an attitude and intelligence unfit for high school let alone a college course - others were super. It seems ridiculous to counsel students in seeking various careers if they are incapable of achieving any of them."

"Program is valuable and serves a community need."

"All instructors should be involved in the development of the curriculum."

"The evaluation after the second year should be more extensive than the one after the first year."

"I feel with some minor modification that the course has definite value and potential."

"Some provisions for a wide range of abilities is necessary. The math meetings were too lacking in continuity (two weeks apart) to be of much worth especially to the student who was less well prepared."

EVALUATION SCHEDULE

TASK	TIME	RESULTS
Pre-assessment evaluation		
1. Background profile	Jan. - Feb. 1977	File for each student
2. Development and administration dealing with attitude toward tech. ed.		Informal questionnaire on attitude and interests
3. Administer aptitude and interest surveys		Scores on aptitude and interest instruments
4. Determine extent to which information disseminated		Publicity check-list
On-going Assessment		
1. Student's evaluation of staff, teaching tech., curriculum, field trips, lab experience, counseling	Feb. - June 1977	Questionnaires and interviews
2. Staff evaluation of students' knowledge, performance of skills and attitudes toward tech. educ.		Staff tests, grades, observations
3. Industries and community evaluation of program		Interviews
Post-assessment evaluation		
1. Determination of completion rate and placement of students	June 1977	Follow-up of students
2. Comparison of completors and drop-outs		Profile of successful technical students
3. Post-tests to determine change in attitude, interest, career goals, self concept		Post-test scores
4. Review of budget		Comparison of proposed budget
5. Long term follow-up of students	June 1978	Follow-up questionnaire

APPENDIX E

FIELD TRIP QUESTIONNAIRE

FOR STUDENTS

Name (Optional) _____

Location of field trip _____

Please answer the following questions. Your response will help us determine the value of this trip. Thanks.

1. The field trip gave me a chance to learn things that have not been covered in class or labs.

   yes _____ no_____

2. The field trip was given at a good time during the semester.

   yes _____ no _____

   If no, why not? _____

   _____

   _____

   _____

3. The people we met during the field trip were

interesting	yes _____	no_____
informed	yes _____	no _____
helpful	yes _____	no _____
understandable	yes _____	no _____

4. I could hear what was being said during the field trip.

   yes _____ no _____ some of the time _____

5. I could see what was being demonstrated during the field trip.

   yes _____ no _____ undecided _____

6. The field trip helped me make decisions relating to my job choice.

   yes _____ no _____ undecided _____

7. The field trip was a good length of time.

   yes _____ no _____

8. I understood what was presented during the field trip.

   yes _____ no _____ some of the time _____

9. I recommend that this field trip be offered to future classes.

yes _____ no _____ undecided _____

10. OPTIONAL: I would like to add these comments about the field trip.

_____

_____

_____

_____

_____

_____

Return to Instructor

APPENDIX F
Instructional Resource Center, Media Center
COURSE DEVELOPMENT GUIDE
For
TRANSITION TO TECHNOLOGY

Design

Course Title_____ Hours_____
Units_____

TRANSITION TO TECHNOLOGY PROGRAM
INSTRUCTOR_____

I. List the major modules in the Program. In addition, complete the instructional questions for each module.

MODULE TITLE_____

MEDIATED CONTENT 5%_____ 10%_____ 20%_____ 40%_____ 50%_____

REMEDIAL LOOPS (yes or no)_____

INDIVIDUALIZED (yes or no)_____

PRIMARILY LECTURE (yes or no)_____

MODULE TITLE_____

MEDIATED CONTENT 5%_____ 10%_____ 20%_____ 40%_____ 50%_____

REMEDIAL LOOPS (yes or no)_____

INDIVIDUALIZED (yes or no)_____

PRIMARILY LECTURE (yes or no)_____

MODULE TITLE_____

MEDIATED CONTENT 5%_____ 10%_____ 20%_____ 40%_____ 50%_____

REMEDIAL LOOPS (yes or no)_____

INDIVIDUALIZED (yes or no)_____

PRIMARILY LECTURE (yes or no)_____

MODULE TITLE_____

MEDIATED CONTENT 5%_____ 10%_____ 20%_____ 40%_____ 50%_____

REMEDIAL LOOPS (yes or no)_____

INDIVIDUALIZED (yes or no)_____

PRIMARILY LECTURE (yes or no)_____

Use additional sheets if necessary.

B. Fradkin

Evergreen Valley College 1976-77

II. Structure and Instruction:

1. Fill in the columns for each kind of scheduled meeting held in the course.

Kind of Meeting Scheduled	Number of Meetings per week	Length in Minutes	Proposed Average Enrollment
a. Large Lecture (all assigned students meeting at one time.)	_____	_____	_____
b. Sections (two or more course sections covering the same materials)			
Section 1	_____	_____	_____
Section 2	_____	_____	_____
c. Discussion groups (do not count meetings when presenting content)	_____	_____	_____
d. Laboratory sessions	_____	_____	_____
e. Individualized Inst.	_____	_____	_____

2. Indicate the approximate number of hours per semester the student will spend in each of the following activities during scheduled class time.

Activity	Approx. No. of Hours
a. Committee Work	_____
b. Student presentations percentage of student presenting	_____
c. Viewing films	_____
d. Viewing film strips or slide program	_____
e. Viewing TV (as a class)	_____
f. Class demonstrations	_____
g. Listening to guest speakers (not including substitutes)	_____
h. Field Trips	_____

1. Other (please identify)

_____
_____
_____
_____

3. Approximately how many hours of scheduled course time will be presented by each of the following self-instruction methods?

a. Programmed Instruction _____

b. TV (individual booth) _____

c. Tape Recorder _____

d. Film Strip or Slide _____

e. Films _____

f. Lecture _____

g. Model Building _____

h. Multimedia _____

4. Approximately how many hours of scheduled course time are utilized in each of the following group methods?

a. Programmed Instruction _____

b. TV (individual booth) _____

c. Tape Recorder _____

d. Film Strip or Slide _____

e. Films _____

f. Lecture _____

5. Indicate the proposed number of each of the following kinds of out of class assignments meet during a semester, and then circle S or D to show whether the assignments are the same for all students or different.

	KIND OF ASSIGNMENT	NUMBER	SAME OR DIFFERENT FOR ALL STUDENTS	
A.	Supplementary reading (books)	_____	S	D
B.	Readings or article handouts	_____	S	D
C.	Readings or articles not	_____	S	D
D.	Written exercises (excluding papers)	_____	S	D

	KIND OF ASSIGNMENT	NUMBER	SAME OR DIFFERENT FOR ALL STUDENTS	
E.	Required written papers	_____	S	D
F.	Laboratory reports	_____	S	D
G.	Viewing mediate content	_____	S	D
H.	Lecture	_____	S	D
I.	Programmed Text	_____	S	D

6. Remedial Instruction

a. Are means provided for remedial work? Yes No

b. Proposed average number of students doing remedial work per semester _____

c. Average number of hours spent by each student in remedial work _____

d. Check each type of remedial work given:

1. Review session by teacher _____
2. Review session conducted by a student assistant _____
3. Individual study outlined by teacher _____
4. Programmed material _____

e. Check each kind of instructional mode used:

1. Individual _____
2. Small group (5 or less) _____
3. Large group (6 or more) _____

f. Check each kind of instructional material used for self-instruction:

1. Written _____
2. Mediated _____
3. Verbal _____

III. Evaluation

		Circle One	
1.	Objectives		
a.	Will objectives be written down in advance of the course? For example: Given a list of 35 chemical elements, the learner must be able to recall and write the valences of at least 30.	Yes	No
b.	Will these objectives be made available to the students? If yes: Check the method of making objectives known 1. Oral presentation 2. Objectives are written and passed out 3. Other (please identify)	Yes	No
c.	Will the objectives be written primarily in behavioral or observable terms? See illustration of behavioral objective in (a.)	Yes	No
d.	Will objectives be prepared with the aid of the students?	Yes	No
2.	Will a pre-test be given at the start of the course?	Yes	No
	If yes: Is the pre-test used for:		
a.	Revising course objectives	Yes	No
b.	Measuring pupil progress or growth	Yes	No
c.	Pupil diagnosis	Yes	No
d.	Other (please specify) _____		
3.	Grading		
a.	Number of tests given each	_____	
b.	What percentage of testing was of each type below?	_____	
	Essay	_____	
	Short answer or completion	_____	
	Multiple choice or matching	_____	
	True-False	_____	
	Problem solving	_____	
c.	Will standardized tests be used to measure course achievement?	Yes	No
d.	Will tests be written by the instructor for the course?	Yes	No
e.	Will tests from previous classes be used?	Yes	No
	If Yes: With or Without revision?	With	Without
f.	Will any exams be returned to the students?	Yes	No
	If Yes: Will exams be returned to all students or only to those interested?	All	Other
	Will the returned exams be used for instructional purposes?	Yes	No
	What will the average number of days be between the student taking the exam and getting it back?	_____	

g. How many of each of the following will be used in computing the final grades?

Tests _____
Written papers _____
Oral presentations _____
Other (please specify) _____

_____
_____

h. What percentage of the final grade will be based upon

Written papers? _____
Tests? _____
Oral presentations? _____
Absences? _____
Participation? _____
Improvement? _____
Other (please specify) _____

_____
_____

4. Check the method primarily to be used in computing the final grade.

Curve (for example, best 10% = A) _____
Percentage scale (for example 90 and above = A) _____
Individual progress _____
Performance criteria _____

5. Teacher Evaluation

a. Will the course be evaluated by students? Yes No
By a teacher-made questionnaire? Yes No
By a college-constructed questionnaire? Yes No
By solicited comments? Yes No

b. Will the course be evaluated by
An administrator? Yes No
A supervisor? Yes No
Others (not students) (please specify)

_____
_____
_____

APPENDIX G

COURSE: MANUFACTURING MATERIALS

INSTRUCTOR: Andy McFarlin, Evergreen Valley College

TEXT: Technology of Industrial Materials, Barnett, Peoria, IL, 1974

Date/Hour & Group #	Topic & Activity
2/4	Importance of knowledge of materials. Properties of materials. What mechanical loads are placed on materials.
2/7, 12:30	The atomic structure of materials. How are properties of materials controlled and altered. How and why do we test materials.
2/9, 12:30 Group A	General safety rules. Writing and recording test data. Safety test. Heat treatment of aluminum.
2/14, 12:30 Group B	Heat Treatment of high carbon steel. Hardness testing. Compression testing of timber.
2/23, 12:30 Group A	Impact tests. Shear test. Torsion test.
2/28, 12:30 Group B	Cut and mount metallographic specimens.
3/7, 12:30	Control of grain structure. Slip, creep and fatigue. Use of handbooks and literature.
3/9, 12:30 Group A	Polish and etch metallographic specimens.
3/14, 13:30 Group B	Tensile test.
3/21, 12:30	Rubber, Plastics, Timber.
3/28, 1:30	Glass, Ceramics, Concrete.
3/30, 12:30 Group A	Shore durometer and elastometer tests. Beam test. Fatigue test.

Date/Hour & Group #	Topic & Activity
4/11, 12:30 Group B	
4/13, 12:30	Electrical properties, galvanic action corrosion.
4/20, 12:30 Group A	Effects of temperature on electrical resistance. Fatigue test.
4/22, 12:30 Group B	Non-destructive testing.

Transition to Technology - Spring 1977
Computer Science Component

Course Outline

I. How We Arrived at the Computer Era

A. What is a computer

B. What is data processing

C. History of data processing

D. Computer uses

1. Education

a. Computer assisted instruction

b. Games

c. Tutorial Systems

2. Music and Arts

a. Programs that refine one's ability to listen and pick out musical structures

b. Programs which allow a composer to write a piece of music which is immediately played back on a synthesizer. It can then be altered and amended as desired.

c. Computer graphics

d. Choreography and dramatic staging

3. Literature

Editing, poetry, analysis of prose

4. History

Trend plotting of dates

5. Health Sciences, Librarianship, Linguistics, Political Science and Psychology (as illustrated briefly throughout the course).

6. Personal Activities

a. Banking, mail, travel, etc.

II. The Computing System (How it works)

A. INPUT/OUTPUT

B. Central Processing Unit (CPU)

C. Memory

D. Algorithm

E. Flowcharting

III. Language

A. Low Level Languages

B. High Level Languages

C. Compilation

IV. Batch Processing Versus Timesharing

A. Demonstration of Each System

B. Student Executes one batch program and one timesharing program.

C. The computer in Society

COURSE: TECHNICAL MATHEMATICS

INSTRUCTORS: Jean Grabiec, Evergreen Valley College
Kathy Stark, General Electric
Elizabeth Raia, San Jose State University

TEXT: Career Mathematics, Industry and the Trades. Lyng, Meconi and Zwick.

COURSE OUTLINE

Meeting	Date	Instructor	Topic(s)	Text Reference
1	2-7-77	Grabiec	Introduction and review of outline. Reading meters, tachometers, rounding numbers. Introduction to reading graphs. Self-analysis testing.	Ch. 1, pp 1-42
2 (2 hrs.)	2-16	Grabiec Stark	Measurement, graphs, fractions, ratio and proportion.	Ch. 2, pp 43-63 Ch. 9, pp 259-271
3	2-18	Grabiec	Fractions, ratio and proportion.	Ch. 3, pp 73-98
4	3-2	Grabiec	Decimals and percent. Use of calculators.	Ch. 4, pp 99-119
5	3-7	Grabiec	Measurement using decimals. Use of calculators.	Ch. 4, pp 120-136
6 (2 hrs.)	3-16	Grabiec Stark	Algebraic terms, expressions, equations, exponents and order of operations -- TEST	Ch. 5, pp 137-168
7	3-21	Grabiec	Algebra continued, measurement.	Ch. 6, pp 181-191 Ch. 7, pp 203-217
8	3-28	Grabiec	Geometry, constructions, angles, measuring and relationships of angels and parallel lines.	Ch. 8, pp 229-258
9	4-13	Grabiec	Geometry continued, congruent and similar triangles, ratio and proportion.	Ch. 9, pp 272-283
10	4-19	Grabiec	Algebra, measurement -- TEST	Ch. 10, pp 289-32
11	5-16	Raia	Introduction to the use of computers.	
12	5-18	Raia	Introduction to the use of computers.	

Evergreen Valley College
Transition to Technology
Guidance (Career Planning)

Instructor
Yolanda Reynolds, A-3-112
274-7900 Ext. 333

Course Outline

Description

Career choice and development through personal assessment by the use of tests and self-analysis, an analysis of the world of work, a study of specific areas of work in the technological fields.

Objectives

1. To develop a greater understanding of personal career interests and aptitudes in a technological career.
2. To learn the educational requirements of a specific occupation.
3. To gain confidence in applying and interviewing for training programs and jobs.
4. To plan a course of action for completion of basic skill development.

Grading pass - no pass

Course Calendar

Date		Assignment Due
Feb. 8	Review "TTT Job Search in Technology"	May 15
Feb. 15	Kuder Interest Inventory D.A.T. A. Spatial Relations B. Mechanical Ability	
Feb. 27	Test Interpretation of Kuder and D.A.T., Resume Writing - Applications	March 13
Mar. 13	Interview Techniques	
Apr. 17	Mock Interview	
May 15	Group discussion - Career Choice	

TRANSITION TO TECHNOLOGY

ELECTRONICS

C. Wojslaw

Introduction

The Profession
The Industry
The Education

CONCEPTS AND PRINCIPLES

Potential and Kinetic Energy (Demonstration)
Voltage and Current (Demonstration)
Energy Storage and Conversion (Demonstration)
Electronic Components and Symbols (Demonstration)
Related Math

FABRICATION AND ASSEMBLY

Soldering (Demonstration and Film)
Soldering Lab

TEST AND MEASUREMENT

Test Equipment (Demonstration and Film)
Electronics Measurements (Demonstration)
Measurements Lab

CIRCUITS

Amplifiers and Oscillators (Demonstration)
Circuits Lab

SYSTEMS

Computers and the Radio (Demonstration and Film)
Systems Lab

PROJECT
Radio
Project Lab
Review

CONCLUSION
Test
Tour

APPENDIX G (continued)

COURSE: INDUSTRIAL GRAPHICS

INSTRUCTORS: Andy McFarlin, Toni Stevens, Carolyn Trammell -- Evergreen Valley College

TEXT: Drafting for Industry, Goodheart-Wilcox Co., Inc., South Holland, IL, 1974.

Date/Hour & Room	Instructor	Topic & Activity	Text Reading	Problem Assignment
2/18, 2:30 B-142	McFarlin	Types & levels of training programs available, types of industry & business employing, types of job activity, personality & aptitudes required.	Part I, Chs. 20-28(look at illus., only read as you desire).	P 16, #1 #2
2/25, 12:30 B-142	Stevens	Samples of various types of industrial graphics. Principles of shape & proportion. Principles of sketching, concepts of multi-view orthographic presentation.	Ch 3 & 7	P 64, #16 P 137
2/25, 1:30 B-134	Stevens	Free-hand sketching, orthographic sketch.	Ch 7	P 134-135
3/4, 1:30 F-134	McFarlin	Orthographic views, shape clarification, orthographic sketches from objects.	Ch 7	
3/11, 12:30		Plant Tour. Meet at B-142. Bus will take group on tour of industrial use of graphics.		
3/18, 12:30 B-142	McFarlin	Concepts of 3-dimensional presentation, perspective, oblique, isometric, and exploded views. Use of drafting machine.	Ch 11	
3/18, 1:30 F-134	McFarlin	Perspective drawing of large object, isometric drawing problem, oblique drawing from text.	Ch 11	P 225, #3
3/25, 12:30 B-142	McFarlin	Size & shape description, use of dimensions & dimensioning and tolerances for function. Use of drafting instruments.	Ch 8	
3/25, 1:30 B-134	McFarlin	Dimensioned orthographic mechanical drawing.	Ch 8	P 139, #1 P 143, #4
4/15, 12:30 B-142	Trammell	Electronic drawing, schematic layouts and microcircuitry.	Ch 23	

Math Component TTT
Spring 1978

Text: Career Mathematics, Lyng, et al

DAY 1

READING METERS, and GRAPHS

Electric Meters

Assignment:		IN CLASS	OUT OF CLASS
p. 2	Exercise	1,2,5,6	3,4
Gas Meters			
p. 3		1,2,5,6	3,4

Whole Numbers and Place Value

Reading numbers
Writing numbers
Rounding off
Flow chart

p. 6	1,2,4,5,7,8	3,6,9,12
Tachometer		
p. 7	1,2,3,5,6,7	4,8
p. 8		Self Analysis Test

DAY 2

READING GRAPHS (cont.)

p. 11	1,2,3,4,7,8,9,12	5,6,10,11
p. 13	2,4,7,10	3,6,9
pp. 14, 15	3,6,9	4,7,10
pp. 16, 17		Self Analysis 2

READING RULES

pp. 22, 23	1,4,7,10	3,6,9,12
pp. 25-26	1,6,11,16,21 26,31,36	5,10,15,20,25 30,35

1098a

READING RULES (cont.)

COMPARING LENGTHS

Assignment:		IN CLASS	OUT OF CLASS
pp.27,28	Exercise	1,6,7,11,12 16,17	5,10,15,20
Metric Scales			
pp. 29, 30		1,2,3,4	5
p. 31			Self Analysis 3

READING TECHNICAL DRAWINGS

Lines		
p. 33	1,3	2,4
Dimensions		
p. 35	2	3
Curves and Angles		
p. 37	3,4	1,2
p. 38		Self Analysis 4

DAY 4

ADDING AND SUBTRACTING FRACTIONS

Same denominator (Note use of parentheses)		
pp. 44, 45	1,2,3,4,6,8,9 11,12,13,14	5,10,15
Different denominators		
Same dimension on rule		
pp. 47	1,2,3,4,6,7,8,9 11,12,13,14,16 17,18,19	5,10,15,20

DAY 4 (cont.)

	IN CLASS	OUT OF CLASS
Different denominators		
1.c.d. with flow chart		
p. 50	1,2,3,4,6,7,8,9 11,12,13,14,16 17,18,19	5,10,15,20
p. 51		Self Analysis 5
Adding and Subtracting Mixed Numbers.		
Method 1: Change to fractions Method 2: Add whole numbers, add fractions, reduce		
pp. 56, 57	1,2,3,4,6,7 9,11,12,13,14	5,10,15
pp. 59, 60	1,2,3,4,6,7 9,11,12,13,14	5,10,15
p. 60		Self Analysis 6
Denominate Numbers Inches to Feet and inches		
pp. 63, 64	1,4,6,7,9,12	5,10,15
p. 66	1,2,3	
p. 67		Self Analysis 7

DAY 5

MULTIPLYING FRACTIONS

p. 74	1,4,6,7,11,12,14	5,10,15
pp. 76, 77	1,4,6,7	5,10
pp. 78, 79	1,2,6,7,11,12,14 16,17	5,10,15,20

DAY 5 (cont.)

	IN CLASS	OUT OF CLASS
Cancellation		
p. 81	1,4,6,7,8	5,10
		Self Analysis 8
DIVIDING FRACTIONS		
Define Reciprocals		
p. 82	1,4,6,7,8	5,10
Define by a whole number		
p. 83, 84	1,3,4,6,7,9,11,12	5,10,15
Division by a fraction		
p. 86	1,2,5,7,8	3,6,9,15
Estimating		
p. 88	2,4,6,8	3,6
Word Problems		
pp. 90, 92		5
		Self Analysis 10

DAY 6

Test -- Chapters 1, 2, 3

DAY 7

DECIMALS, PERCENTS

Decimals and Fractions

Assignment:	In Class	Out of Class
pp. 100, 101	4,9,13,17,22	5,10,15,20,25
Equivalent Decimals See chart p. 102		
pp. 104, 105	4,9,14,19,24,29 34,39	5,10,15,20,25,30 35,40
p. 105		Self Analysis 11

DAY 7 (cont.)

Adding and Subtracting Decimals		
pp. 107, 108	4,8,14,19,24	5,10,15,20,25
Multiplying Decimals		
pp. 110, 111	4,9,14,19,24,29	5,10,15,20

MICROMETERS

pp. 114, 115	4,9	5,10
Dividing Decimals		
pp. 118, 119	4,9,14,19,24,29	5,10,15,20
p. 119		Self Analysis 12

DAY 8

PERCENTS

Meaning		
pp. 121, 122	4,9,14,19,24,29	5,10,15,20,25,30
Discounts (% of a number)		
p. 123	2,5,7	3,6
Machine Tolerance		
p. 124	2,4,7,11	3,6,9
Electrical Tolerance		
p. 127	3,4	5
Efficiency		
p. 128	3,4	5
p. 129		Self Analysis 13
p. 130		Measuring Your Skills - 5,10,15 20,25,30

DAY 9

EQUATIONS AND FORMULAS

Terms, expressions, & equations		
Assignment:	In Class	Out of Class
p. 139	4,9,14,19	5,10,15,20

DAY 9 (cont.)

Exponents		
p. 141	4,9,14,19	5,10,15,20
Order of Operations		
p. 142	4,9,14,19	5,10,15,20
p. 143		Self Analysis 14
Solving Equations by Subtraction		
pp. 145, 146	4,9,14,19	5,10,15,20
Solving Equations by Addition		
p. 148	4,9,14,19	5,10,15,20
Solving Equations by Division		
p. 150	4,9,14,19	5,10,15,20
Solving Equations by Multiplication		
p. 153	4,9,14,19	5,10,15,20
Solving Equations by Combined Methods		
p. 157	4,9,14,19	5,10,15,20
p. 157		Self Analysis 15

DAY 10

WORKING WITH FORMULAS+

Writing formulas from Rules		
p. 161	4,9	5,10
Solving Formulas		
p. 164	4,9,14	5,10,15
		Self Analysis 16

Quiz: Chapters 4, 5

DAY 11

LENGTH, AREA VOLUME

Linear Measure (Perimeter)		
pp. 170,171	4,9,14	5,10
pp. 172,173	4,9,14	5,10
p. 173		Self Analysis 17
Square Measure		
Area of Parallelograms		
p. 177	4,9,14,19	5,10,15
Area of Triangles		
p. 179, 180	4,14	3,13

DAY 7 (cont.)

Adding and Subtracting Decimals		
pp. 107, 108	4,8,14,19,24	5,10,15,20,25
Multiplying Decimals		
pp. 110, 111	4,9,14,19,24,29	5,10,15,20
MICROMETERS		
pp. 114, 115	4,9	5,10
Dividing Decimals		
pp. 118, 119	4,9,14,19,24,29	5,10,15,20
p. 119		Self Analysis 12

DAY 8

PERCENTS

Meaning		
pp. 121, 122	4,9,14,19,24,29	5,10,15,20,25,30
Discounts (% of a number)		
p. 123	2,5,7	3,6
Machine Tolerance		
p. 124	2,4,7,11	3,6,9
Electrical Tolerance		
p. 127	3,4	5
Efficiency		
p. 128	3,4	5
p. 129		Self Analysis 13
p. 130		Measuring Your Skills - 5,10,15 20,25,30

DAY 9

EQUATIONS AND FORMULAS

Terms, expressions, & equations		
Assignment:	In Class	Out of Class
p. 139	4,9,14,19	5,10,15,20

DAY 9 (cont.)

Exponents		
p. 141	4,9,14,19	5,10,15,20
Order of Operations		
p. 142	4,9,14,19	5,10,15,20
p. 143		Self Analysis 14
Solving Equations by Subtraction		
pp. 145, 146	4,9,14,19	5,10,15,20
Solving Equations by Addition		
p. 148	4,9,14,19	5,10,15,20
Solving Equations by Division		
p. 150	4,9,14,19	5,10,15,20
Solving Equations by Multiplication		
p. 153	4,9,14,19	5,10,15,20
Solving Equations by Combined Methods		
p. 157	4,9,14,19	5,10,15,20
p. 157		Self Analysis 15

DAY 10

WORKING WITH FORMULAS+

Writing formulas from Rules		
p. 161	4,9	5,10
Solving Formulas		
p. 164	4,9,14	5,10,15
		Self Analysis 16

Quiz: Chapters 4, 5

DAY 11

LENGTH, AREA VOLUME

Linear Measure (Perimeter)		
pp. 170,171	4,9,14	5,10
pp. 172,173	4,9,14	5,10
p. 173		Self Analysis 17
Square Measure		
Area of Parallelograms		
p. 177	4,9,14,19	5,10,15
Area of Triangles		
p. 179, 180	4,14	3,13

APPENDIX G (continued)

DAY 12

AREAS OF CIRCLES

Assignment:	In Class	Out of Class
p. 185	1,2,3,4,7,8, 10,12,15,18	

CUBIC MEASURE

Volumes of Rectangular solids p. 191	3,6,9,12,15,18	

COURSE: MANUFACTURING PROCESSES

INSTRUCTOR: Douglas Tozinni

TEXT: Manufacturing Processes, Johnson, Bennette Publishing Co.

COURSE OBJECTIVE: The object of the manufacturing processes portion of TTT is to give the students basic information regarding the nomenclature and application of the various industrial processes and to develop basic manual skills by practical problems in the lab.

Lecture

I. Basic types of manufacturing

- A. Short run operations, prototypes, job shops
- B. Mass production operations, automation

II. Employment opportunities related to manufacturing

- A. Operational classifications, background and education required
- B. Support activity classifications, background and education required

III. Basic forms of material processing

- A. Casting
- B. Forming, shearing
- C. Machining
  - 1. Chip forming processes
  - 2. Chipless forming processes
- D. Heat treatment
- E. Finishing
- F. Assembly
- G. Inspection

Laboratory activities

I. Safe practices

- A. Machine and hand tool safety
- B. Hazardous materials

II. Construction of sheet metal project

- A. Layout
  - 1. Tools and methods
  - 2. Accuracy
- B. Cutting
  - 1. Use of squaring shear
  - 2. Use of hand snips

C. Forming

1. Use of universal brake
2. Use of bar folder
3. Use of pan brake

D. Fastening

1. Use of spot welder
2. Drilling
3. Use of sheet metal screws

E. Finishing

1. Use of files
2. Use of wire wheels

III. Construction of machine project

A. Cutting stock

1. Measurement of stock
2. Use of horizontal band saw

B. Introduction to basic lathe work

1. Cylinderical turning
2. Cut-off operations
3. Facing operations
4. Knurling
5. Use of micrometer

C. Drilling

1. Drill press operation
2. Correct damping methods

D. Threading

1. Use of hand taps and dies
2. Thread measurement

Plant tours viewing manufacturing operations

I. Lockheed Missiles and Space Co.

A. Microelectronics (manufacture of integrated circuit chips)

1. Methods of processing
2. Methods of assembly
3. Methods of inspection

B. Component and assembly testing

1. Environmental
2. Reliability

II. Hewlitt-Packard Corporation

A. Plastic part fabrication
B. Sheet metal fabrication and finishing
C. Machining operations
D. Assembly procedures and methods
E. Inspection
F. Electronic testing

ENGINEERING MATERIALS

Mr. A. McFarlin — Laboratory Experiment 1

Purpose: To develop a general understanding of the basic properties of several materials. To develop concepts of analysis of the properties of various materials on an independent basis. To become more aware of the properties of various materials and to approach their use and selection with greater intelligence and more critically.

Procedure: You will be furnished five different samples of materials.

1. silicon rubber
2. glass, soda lime silica
3. lead
4. aluminum, 2024-T4
5. steel, SAE 1018, CR

After receiving specimens of each of the above materials, you may use any or all of the following items to assist you in developing a written analysis of the properties of each material. It is suggested that you present such information in chart form as well as written form.

1. magnet
2. set of MOH hardness mineral specimens
3. balance and set of gram weights
4. scale, 12 in, 12 in.
5. bunsen burner, tripod stand, screen, tongs, tempil sticks (asst temperatures), caliper
6. ampere meter
7. leads with alligator clips, dry cell
8. stoppered bottle containing solution of hydrochloric acid and water, tongs, gloves, apron, face shield (please note when removing specimen which has been immersed in this acid solution, please be very careful to thoroughly rinse off this specimen under running water before handling.

There are a number of properties of materials that can be experimentally compared and measured in an empirical fashion.

1. appearance
2. chemical reaction to corrosive agents
3. expansion and contraction
4. electrical conductivity
5. flexibility, hardness, magnetism, weight

STUDY QUESTION SHEET 1-T

Student_____

MATERIALS OF MANUFACTURING

1. Select some fairly simple item in your home that is made of metal or plastic.
   a. Describe what environment it must function in.
   b. What properties do you think it should have in order for it to function properly?
   c. Does this article function properly, or do you feel that it could have been made of a material better suited to its use?
      (use the back of this sheet for your answer)

2. What are the four basic types of mechanical loading?

3. What are four of the several properties of materials? Give two examples of each.

4. Write a brief statement of why materials are tested.

5. Give two methods by which properties of materials can be changed.

METALLURGIC SPECIMEN PREPARATION

Group				
	1	Mount, grind, polish, etch w/regent	#1	T2
	2	Mount, grind, polish, etch w/regent	#1	T2
	3	Mount, grind, polish, etch w/regent	#1	T2
	4	Mount, grind, polish, etch w/regent	#4	T2
	5	Mount, grind, polish, etch w/regent	#7	T7
	6	Mount, grind, polish, etch w/regent	#7	T7

Examine each prepared specimen starting with the 5X objective lens, and working up to the 40X objective lens. At whatever power of magnification you find the specimen most revealing, set up the metallograph take a photomicrograph. After preparing the photomicrograph, try to compare what you observe with what the lab reference book indicates the particular etch reveals.

Note: Record all data from settings on the metallograph.

Mount Photomicrograph Here

Magnification _____
Amperage _____

Comments and Observations:

Lamp Iris diaphragm_____
Aperture diaphragm _____
Field diaphragm _____

Filters Used-Heat Absorbing

Yellow _____
Green _____
Condensing Lens _____

_____Setting_____
_____Setting_____
_____Setting_____
Shutter Setting _____
Film Speed _____

SHORE DUROMETER TEST: (Hardness test of rubber and rubber-like plastics)

Test one specimen of a dense type material

Test one specimen of a sponge type material

Test one specimen of an item brought from home

Record results of three tests and take an average. Identify or describe the type of material tested. Test each of the above materials for elasticity using the Shore Elastometer.

Compare results between the two tests. What conclusions do you draw?

Shore Durometer

Material	Type	Size	Temp	Shore Scale	Readings 1st	2nd	3rd	Avg.

Shore Elastometer

Material	Type	Size	Temp	Shore Scale	1st	2nd	3rd	Avg.

Comments and Observations:

FATIGUE TEST

Group 1 will test an as-is specimen of 1095

Group 2 will test a hardened specimen of 1095

Group 3 will test an as-is specimen with a scribe mask

Group 4 will test an as-is specimen that has been polished

Load all specimens with an eleven pound stress. Record the number of cycles at fracture. If no fracture after 1 million cycles, stop test and make note of this in the report.

Each group should record and compare the data from each of the other three groups.

Group No.	Type of Material	Load Applied	Displacement	Cycles at Fatigue
1				
2				
3				
4				

Comments and Observations:

HEAT TREATMENT AND, HARDNESS TESTING, IMPACT TESTING

Group 1 Test as-is 1095 specimen
2 Test hardened 1095 specimen (heat to 1700 F and quench in oil)
3 Test as-is 1018 specimen
4 Test surface hardened 1018 specimen Kasinite
5 Test as-is 2024-T4 specimen
6 Test annealed 2024-T4 specimen (heat to 900 F cool in sand for two hours, place in refrigeration until ready to test.

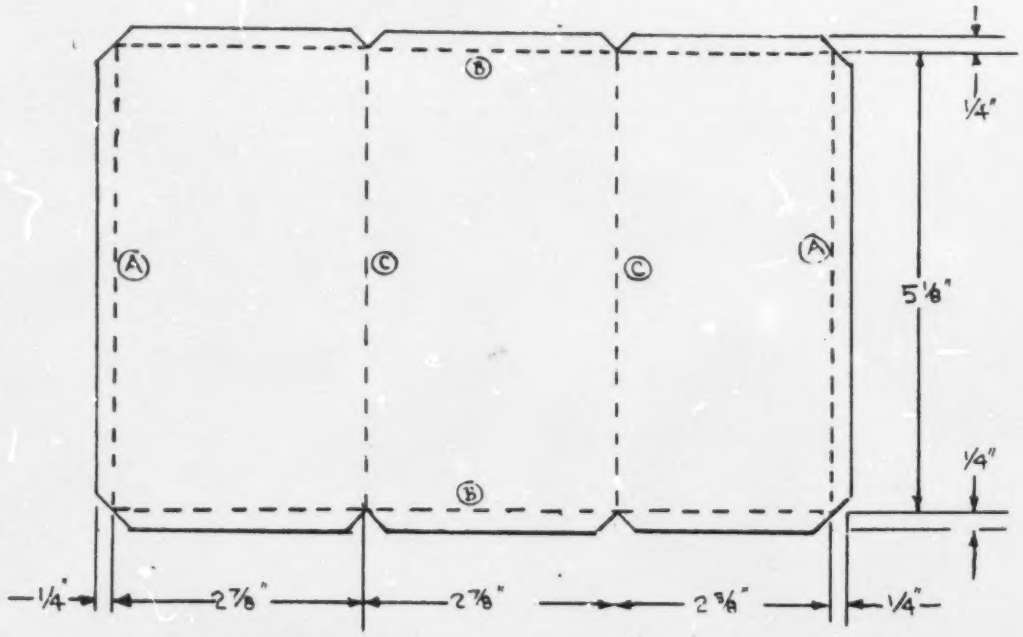
Group No.	Material	Original Hardness	Hardness after heat treatment	Impact Strength
1				
2				
3				
4				
5				
6				

Note: On high carbon specimens use Rockwell C scale or A scale.

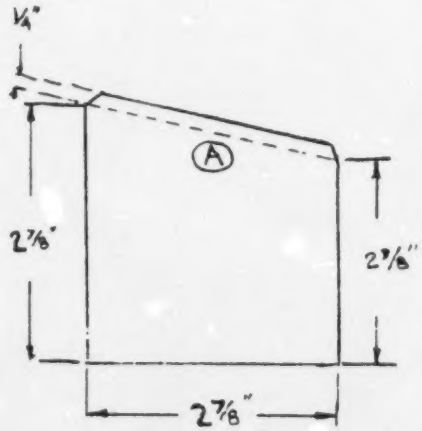
On low carbon steel and aluminum use Rockwell B scale.

On surface hardened steel use Rockwell 15T scale

Comments and Observations:



1 REQ.



2 REQ.

EVERGREEN VALLEY COLLEGE		
SCALE - 1/2	TOLERANCE - ± 1/32"	DATE - 1/2/77
3"X5" CARD BOX		
MAT'L - 6061 T-3		101

APPENDIX G (continued)

OPERATION SHEET

3" X 5" CARD BOX

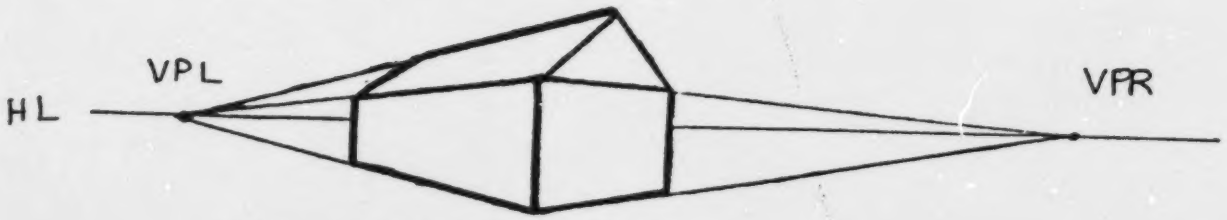
TOOLS

1. Combination square
2. Scriber
3. Tin snips
4. Flat or 3 square file
5. Foot shear
6. Sheetmetal brake
7. Box and pan brake
8. Bar folder

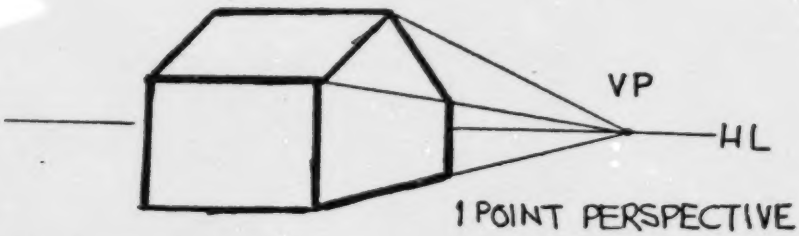
ORDER OF OPERATIONS

1. Blank pieces to size as determined from print using foot shear.
2. Lay out parts to final dimensions using combination square and scriber.
3. Cut notches and corners with tin snips. De-burr with file.
4. Bend edges "A" on sheetmetal brake and flatten with bar folder.
5. Bend edges "B" on sheetmetal brake to 90^{o} bend.
6. Bend lines "C" on box and pan brake to 90^{o} bend.
7. Attach ends by spot welding.

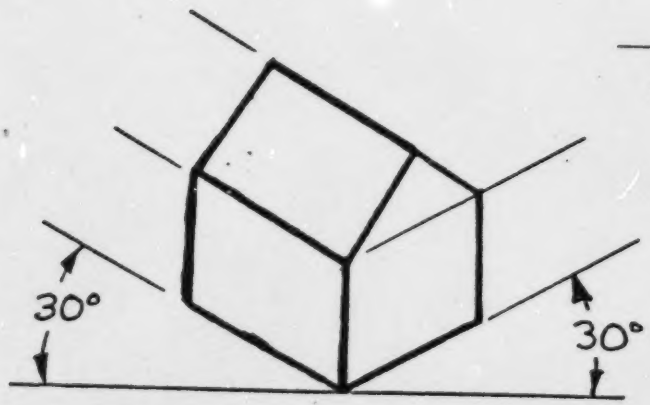
SOME TYPES OF GRAPHIC PRESENTATION



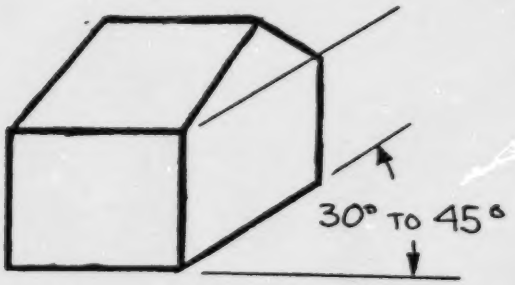
2 POINT PERSPECTIVE



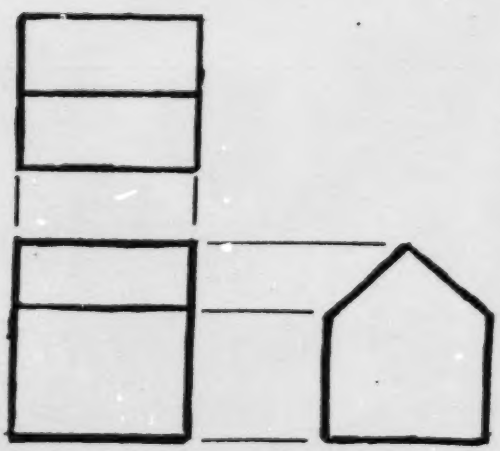
1 POINT PERSPECTIVE



ISOMETRIC



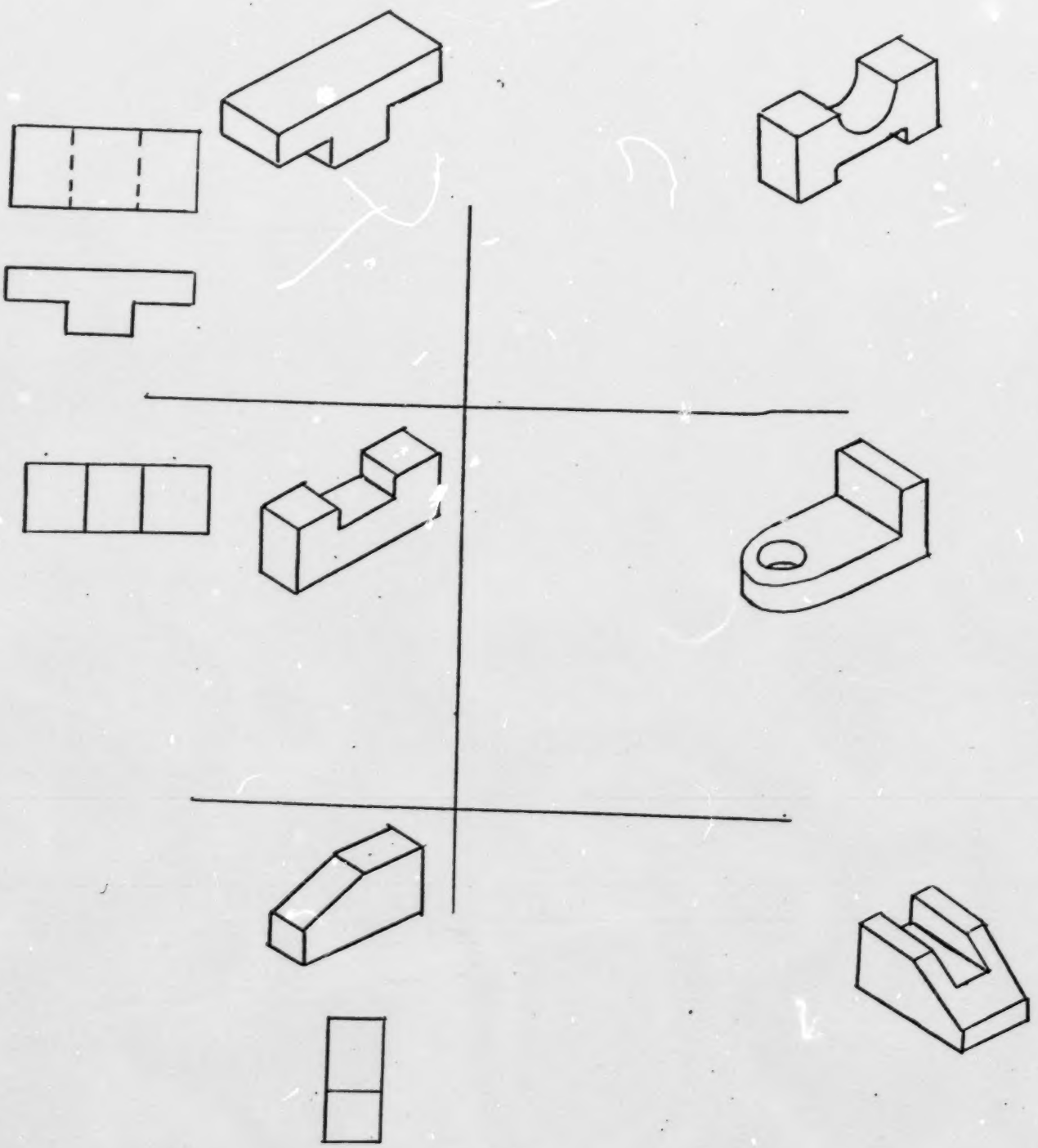
OBLIQUE



ORTHOGRAPHIC

CONCEPTS OF ORTHOGRAPHIC VIEWS

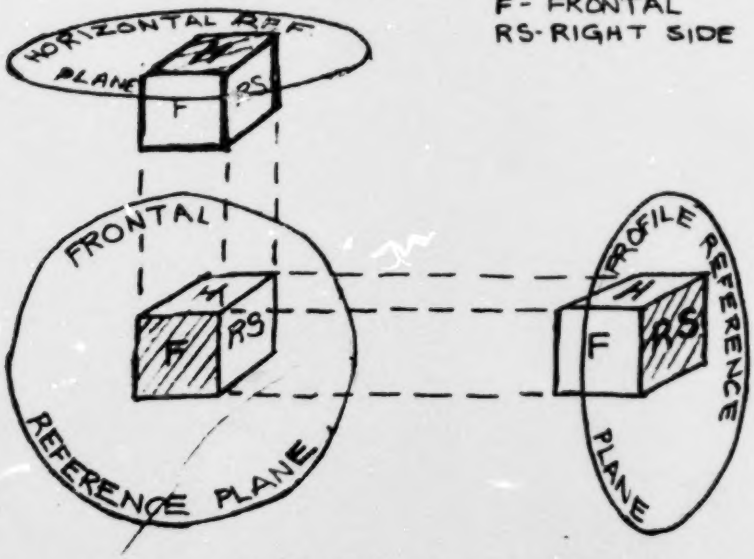
SKETCH THE MISSING ORTHOGRAPHIC VIEWS AS DETERMINED FROM THE PICTORIAL VIEW IN THE UPPER LEF



ORTHOGRAPHIC PROJECTION PRINCIPLES - SOME SKETCH NOTES AMcA

OBLIQUE VIEW

H - HORIZONTAL SURFACE
F - FRONTAL "
RS - RIGHT SIDE "

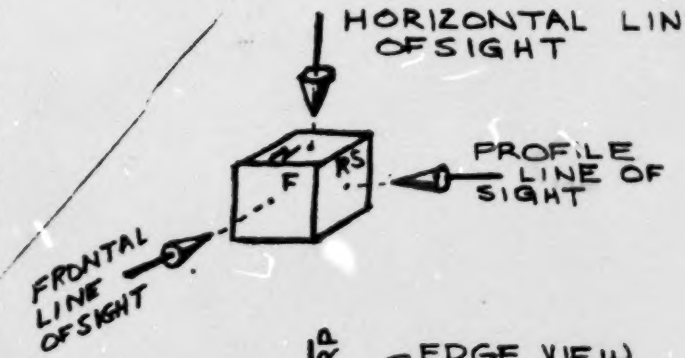


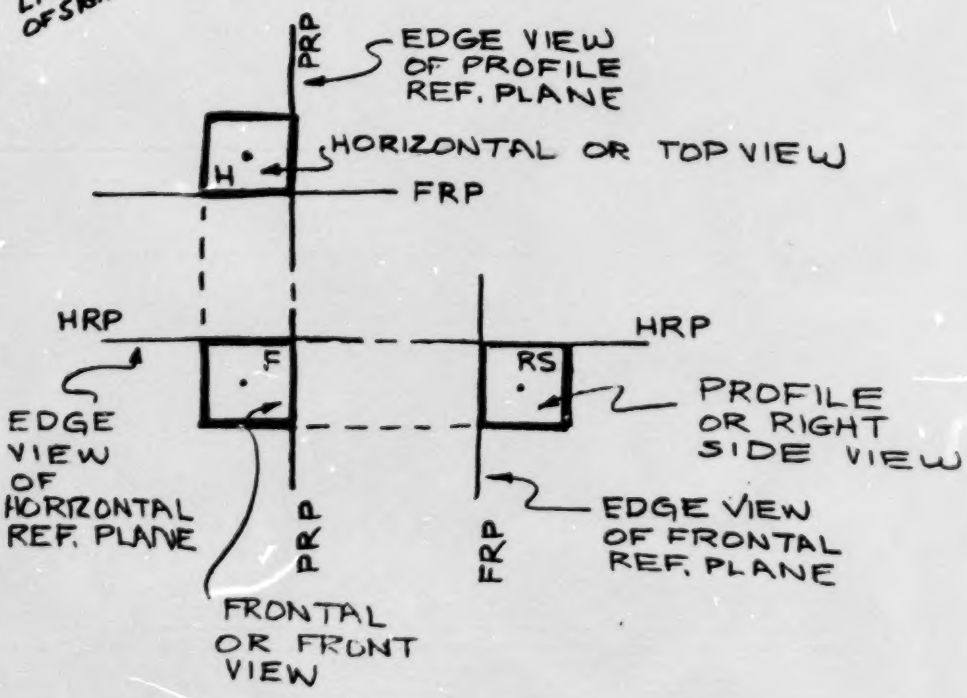
PRINCIPAL PLANES

HORIZONTAL
FRONTAL
PROFILE

EACH PRINCIPAL REFERENCE PLANE IS MUTUALLY PERPENDICULAR TO EACH OF ITS TWO ADJACENT REFERENCE PLANES.

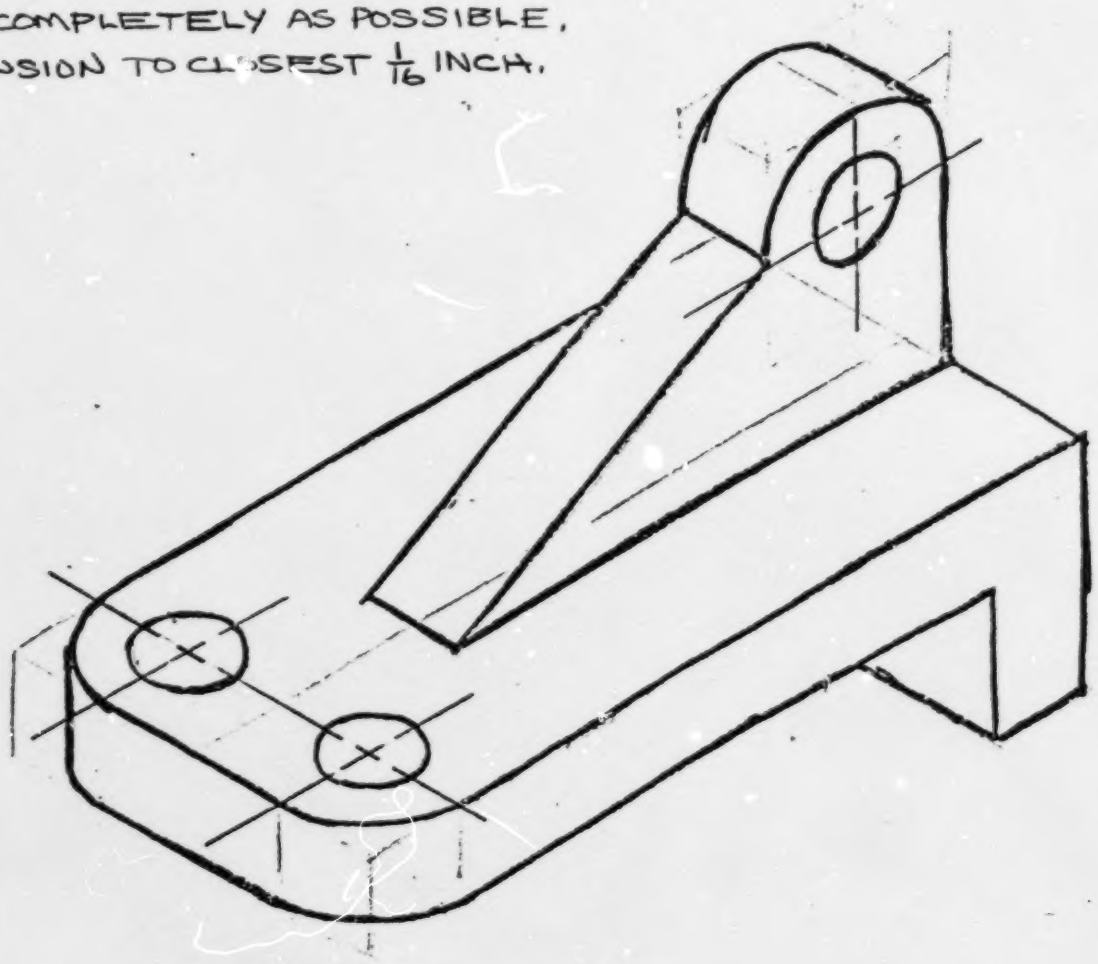
IN EACH NORMAL VIEW, (A VIEW WITH THE LINE OF SIGHT PERPENDICULAR TO THE PLANE BEING VIEWED) ONE WILL FIND EDGE VIEWS OF EACH OF THE TWO OTHER PRINCIPAL REFERENCE PLANES.





DIMENSIONING

CONSIDERING THE PART SKETCHED BELOW TO BE FULL SIZE - DIMENSION IT AS COMPLETELY AS POSSIBLE. DIMENSION TO CLOSEST $\frac{1}{16}$ INCH.



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